DENON

Hi-Fi Component

SERVICE MANUAL

STEREO CD PLAYER

MODEL DCD-1100

NIPPON COLUMBIA CO., LTD.

TABLE OF CONTENTS

FEATURES 2
SPECIFICATIONS 3
NAMES AND FUNCTIONS OF PARTS ..... 4 ~ 5
NOTE FOR HANDLING OF LASER PICK-UP ..... 6 ~ 7
HANDLING, CONNECTION AND SAFETY INFORMATION FOR THE KSS-121A OPTICAL PICK-UP 8
DISASSEMBLY ..... 9 ~ 10
ADJUSTMENT OF MECHANISM UNIT 11
MAINTENANCE AND ADJUSTMENT PROCEDURE ..... 11 ~ 18
FUNCTION OF IC TERMINAL 19
FUNCTION OF SUB CODE OUTPUT TERMINAL 20
TROUBLESHOOTING ..... 21 ~ 25
PARTS LIST OF P.W. BOARD ..... 26 ~ 29
PARTS LIST OF FG-500 CD MECHA UNIT 30
EXPLODED VIEW OF FG-500 MECHA UNIT 31
PARTS LIST OF EXPLODED VIEW 32
EXPLODED VIEW 33
P.W. BOARD ..... 34 ~ 35
WIRING DIAGRAM 36
SEMICONDUCTORS 37
WAVEFORM IN THE CIRCUIT 38
SEHCMATIC DIAGRAM 39

FEATURES

The DCD-1100 compact laser disc player utilizes a unique DENON Super Linear Converter which prevents deterioration of sound quality in the PCM playback system, assuring accurate reproduction in the studio or live sound production areas of sound recorded on compact discs. This high quality disc player, whose parts have been selected after careful discrimination, produces realistic playback of the full musical scene.

SPECIFICATIONS

AUDIO

No. of channels:	2 channels
Frequency response:	5 ~ 20,000 Hz +0.3/–0.5 dB
Dynamic range:	95 dB
Signal-to-noise ratio:	95 dB
Harmonic distortion:	0.004% (1 kHz)
Channel separation:	90 dB (1 kHz)
Wow and flutter:	Less than the measuring limit (±0.001% W. peak)
Output voltage:	2.0 V

DISCS

	Compact discs are used.
Playing time:	60 min/single side (79.8 min/single side)
Diameter:	120 mm

SIGNAL FORMAT

Sampling frequency:	44.1 kHz
Quantization:	16 bit linear channel
Transmission bit rate:	4.3218 M bits/sec

PICKUP

System:	Objective lens drive system, laser pickup
Lens drive system:	Two-dimensional parallel drive
Light source:	Semiconductor laser
Wavelength:	780 nm

GENERAL CHARACTERISTICS

Power supply:	50/60 Hz, Voltage is shown on rating label.
Power consumption:	12 W
Dimensions:	434 (17.1 in) W x 89 (3.5 in) H x 350 (13.8 in) D mm
Weight:	5.0 kg

FUNCTIONS AND DISPLAY

Functions:	Direct selection, quick selection, programmed selection, repeat playback pause, skip monitor, and index search
Display:	Track number, index number, time, and program
Other functions:	Headphone jack, variable level (headphone control)

REMOTE CONTROL UNIT	RC-1100
Remote control system:	Infrared pulse system
Power supply:	3 V DC Two SUM-4 (standard size four) dry cell batteries
External dimensions:	60 (2.4 in) W x 150 (5.9 in) H x 17 (0.7 in) D mm
Weight:	98 g (Includes batteries)
ACCESSORIES	Connecting pin cord

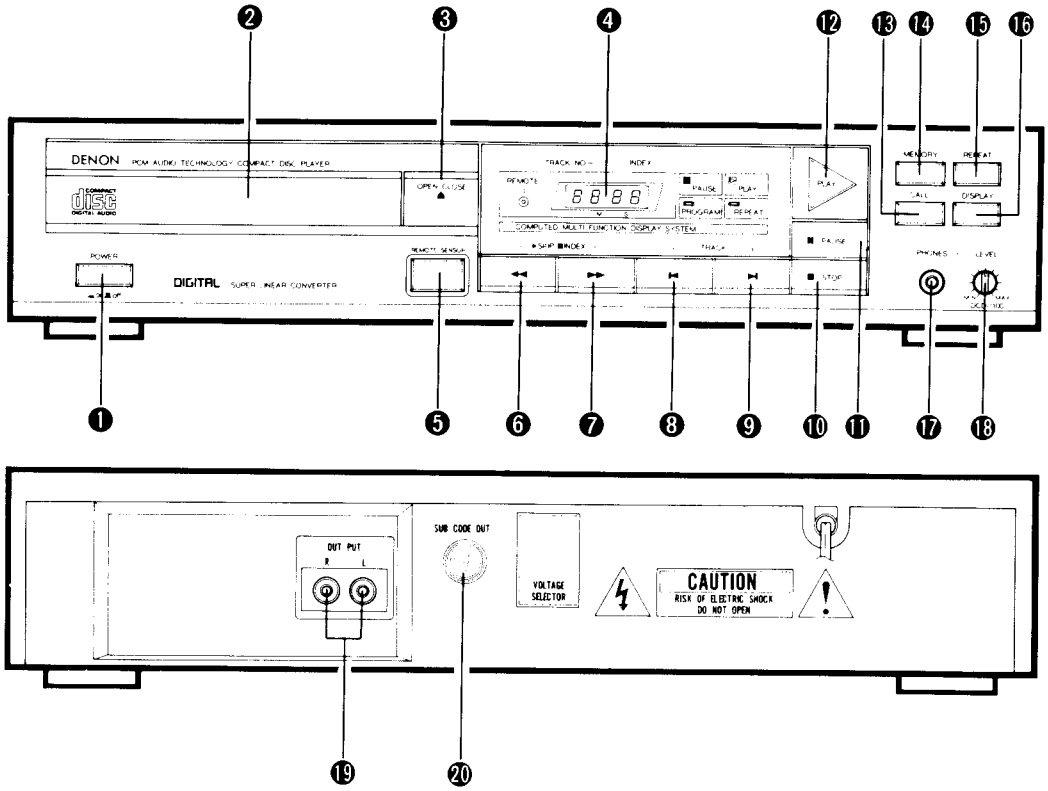
* For product improvement purposes, the above specifications are subject to change without notice.

VAROITUS: **SUOJAKOTELOA EI SAA AVATA. LAITE SISÄLTÄÄ LASER-DIODIN, JOKA LÄHETTÄÄ SILMÄLLE VAARALLISTA LASER-SATEILYÄ.**

ADVARSEL: **USYNLIG LASERSTRALING VED ABNING NAR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGA UDSAETTELSE FOR STRALING.**

" CLASS I LASER PRODUCT "

NAMES AND FUNCTIONS OF PARTS



❶ Power Switch (POWER)

- Press this switch to turn the power source ON.
- When the power is turned ON, (88) will light up in the numeric portion of the display ❹. If no disc is loaded at this time, (– – – –) will be displayed after several seconds.
- If a disc is loaded, the machine automatically enters playback state (Timer start) when the power switch is turned ON. The first recorded piece will then begin to play.

❷ Disc Holder

- The disc is loaded into the disc holder for play.
- The disc holder is opened and closed by pressing the disc holder open/close button (▲ OPEN/CLOSE) ❸.
- It can also be closed by pressing the play button ⓬ (▶ PLAY).

❸ Disc Holder Open/Close Button (▲ OPEN/CLOSE)

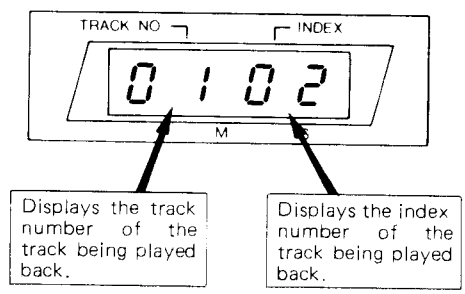
- The disc holder ❷ is opened and closed by pressing this button.
- Press the button once to eject the disc holder ❷. Press it again to close the holder.
- If a disc is inserted when the disc holder is closed, the disc is rotated for several seconds, and then the machine enters STOP state. The first track number (number of piece) on this disc is then displayed on the digital display ❹.

❹ Display

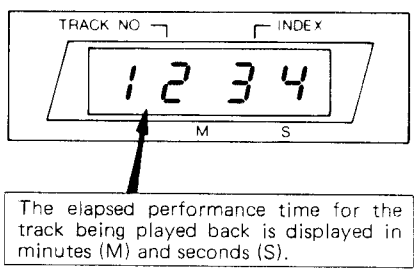
- The numeric portion of the display consists of three sections: 1) the number and index of the piece to be played, 2) the lapsed time of the playback, and 3) the display of the contents in memory.

Use the DISPLAY bubton ⓰ to switch the display to 1) or 2), and the CALL button ⓭ to switch the display to 3). Once a track has started to play, the memory contents cannot be displayed.

(1) Display of track number and index for the track being played back

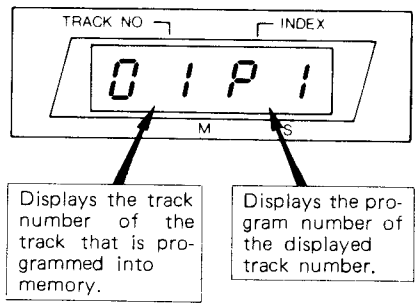


(2) Display of time elapsed during playback (Press the display button.)


TRACK NO
INDEX
1234
M
S
The elapsed performance time for the track being played back is displayed in minutes (M) and seconds (S).

- If a disc is loaded, the total playback time for the disc is displayed.

(3) Display of the contents in memory
(Press the call button.)


TRACK NO
INDEX
0 1 P 1
M
S
Displays the track number of the track that is programmed into memory.
Displays the program number of the displayed track number.

❺ Remote Control Photosensitive Window

- The wireless remote control function utilizes a photosensitive window to receive the transmission.
- The wireless remote control unit should be operated while it is pointed in the direction of the photosensitive window.

❻ Fast Reverse Skip Button (◀◀)

- Press this button to move playback in fast reverse.
- When the machine is in play, sound will be produced as the pickup moves back, during the time that the button is being pressed.

❼ Fast Forward Skip Button (▶▶)

- Press this button to move playback in forward.
- When the machine is in play, sound will be produced as the pickup moves forward, during the time that the button is being pressed.

❽ Track Button (⏮)

- Press this button to move the pickup backward, to advance to the beginning of the desired track.
- If the TRACK button is pressed once during playback or pause, the player returns to the beginning of the current track. Each subsequent time the button is pressed, the player moves backward to the beginning of the track that corresponds to the number of times the button was pressed.

❾ Track Button (⏭)

- Press this button to move the pick up forward, to return to the beginning of the desired track.
- If the TRACK button is pressed during playback or pause, the player moves forward to the beginning of the track that corresponds to the number of times the button was pressed.

❿ Stop Button (■ STOP)

- Press this switch to stop the playback.
- The rotation of the disc stops, and the first track number on the disc is read out on the display.

⓫ Pause Button (⏸ PAUSE)

- Press this button to stop the playback temporarily.
- If the PAUSE button is pressed during playback, the play is stopped temporarily, the PLAY lamp goes out, and the PAUSE lamp lights.
- The end the pause, push the PLAY button ⓬

⓬ Play Button (▶ PLAY)

- Press this button to play a disc.
- When the PLAY button is pressed, the PLAY lamp on the display lights, and the number of the track being played and the index number are displayed.
- When playback of the last track has finished, the PLAY lamp goes out, and the machine enters stop state.
- It is also possible to use the PLAY button to close the disc holder after a disc has been inserted. The first track then begins to play.

⓭ Call Button (CALL)

- Press this button to verify the track numbers that have been programmed into memory.
  When the machine is in play, the button does not function.

⓮ Memory Button (MEMORY)

- Press this key to program the memory to contain selected tracks.

⓯ Repeat Button (REPEAT)

- Press this button to repeat playback.

⓰ Display Button (DISPLAY)

- Press this button to switch the display to a different read out.
  The display can be switched between a read out of the track number and index number and a read out of the elapsed playback time, in minutes and seconds.
- To display the total playback time for the tracks recorded on the disc, this key must be pressed after the user has inserted the disc, pressed the disc holder open/close button (⏏ OPEN/CLOSE), and the first track number has been displayed. Once playback has begun, the total playback time cannot be displayed, even if playback is stopped with the stop button (■ STOP).

⓱ Headphone Jack (PHONES)

- Always use the headphones at an appropriate volume. (Headphones are sold separately.)

⓲ Volume Adjustment Knob (LEVEL)

- Use to adjust the output level (volume) of the headphone jack.

⓳ Output Terminal (OUTPUT)

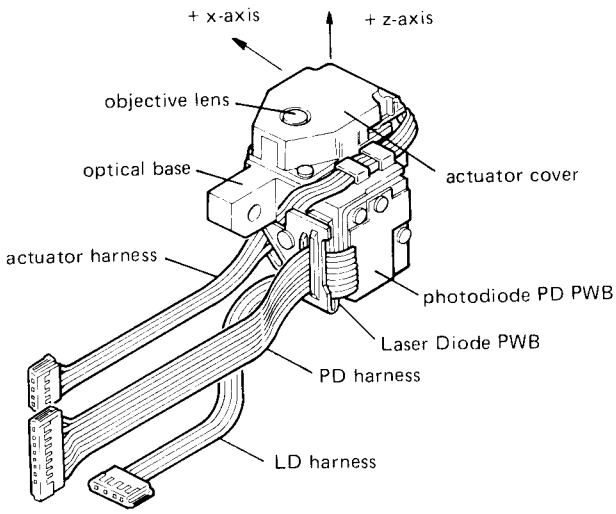
- Connect the output terminal to the input terminal of the amp.

⓴ Sub Code Output Terminal (SUB CODE OUT)

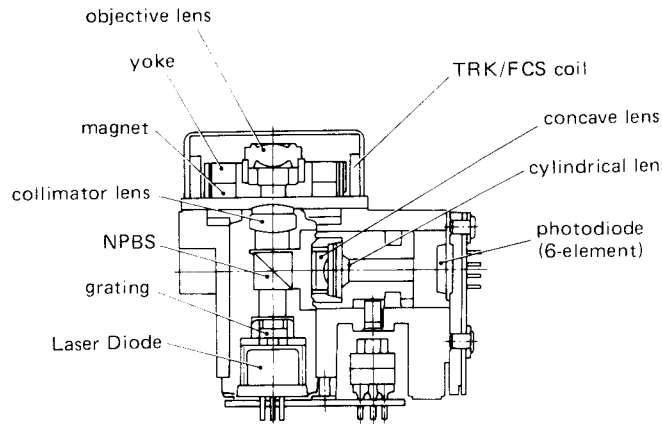
- This output terminal is for a signal that will enable the effective use of the laser disc player in the future.

NOTE FOR HANDLING OF LASER PICK-UP

DESCRIPTION OF THE COMPONENTS



CROSS-SECTIONAL DRAWING OF THE OPTICAL PICK-UP

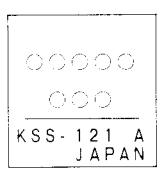


7. Label

7-1. Serial number

This denotes the serial number used for quality control in the manufacturing plant.

7-2. Label



Lot No.

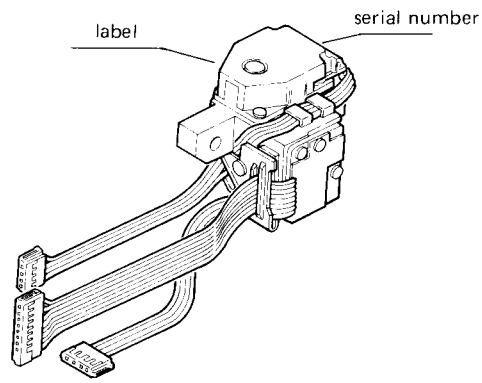
I_{op}

year
(last figure)
day month | quality control No.
○○ ○ ○ ○

10 1 10^{-1}
○ ○ ○

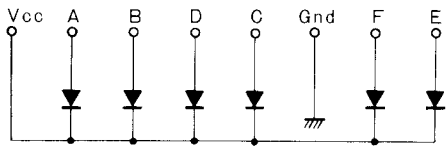
For example, 56.5 mA will be expressed as 565.

7-3. Position of the labels



ELECTRICAL PIN CONNECTION

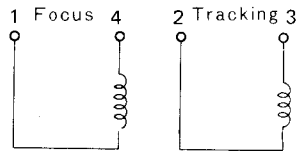
1. PD harness



Pin No.	PD element
1	Vcc
2	A
3	B
4	D
5	C
6	GND
7	F
8	E

1 2 3 4 5 6 7 8
JST
YEL

2. Actuator harness

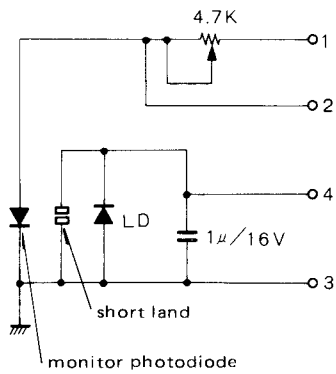


Pin No.	description
1	FCS ⊕
2	TRK ⊕
3	TRK ⊖
4	FSC ⊖

1 2 3 4
JST
YEL

FCS + : Lens moves toward the disc
TRK + : Lens moves toward the center of the disc

3. LD harness



Pin No.	description
1	reference
2	monitor
3	GND
4	laser

1 2 3 4
JST
BLK

HANDLING, CONNECTION AND SAFETY INFORMATION FOR THE KSS-121A OPTICAL PICK-UP

1. Handling Instructions

Please read the following instructions carefully before handling pick-ups.

1) Handle with care

The pick-up KSS-121A is assembled and precisely adjusted using a sophisticated manufacturing process in our plant. Keep the pick-up protected from vibration and impact. Do not disassemble or attempt to re-adjust it. Hold the optical base (aluminum diecast) when handling it. Do not touch the PD and LD PWB (Printed Wiring Board).

2) Storage

Do not store the pick-up in dusty, high-temperature or high-humidity environments.

3) Laser Diode

Protect Your Eyes

Do not look at the laser light beam through the objective lens directly nor another lens or a mirror. The laser beam may damage the human eye, since the intensity of the focusd spot may reach 1.3×10^4 W/cm^2 even if the intensity at the objective lens is 400 μW maximum.

Poison

The LD chip contains As (arsenic), a poison. Although the poison is relatively weak and the amount is small, avoid putting the chip in acid or an alkali solution, heating it over 200°C or putting it into your mouth.

Avoid surge current or electrostatic discharge

The LD may be damaged if a large current is applied to it, even if only a short pulse. For safe handling of an LD, grounding the human body and measuring equipment is strongly recommended. Make sure that there is no surge current in the LD driving circuit. The PINs of the LD are short-circuited for protection during shipment. To open the short circuit, remove the soldering quickly with a soldering iron whose insulation resistance is larger than 10 MΩ after connection to a suitable *APC circuit. The temperature of the sildering iron should be less than 320°C.

Note: *APC (Auto Power Control)

4) Actuator

The performance of the actuator may be effected if magnetic material is located nearby, since the actuator has a strong magnetic circuit.

Do not permit dust to enter through the gap of the cover.

Cleaning the lens:

Lens-cleaning paper with 50 : 50 mixed solvent of IPA (Isopropyl alcohol) and Freon (freon 113 CC1 F-CC1F) is recommended.

2. Connections

1) How to mount the pick-up

Use the reference plane as shown in the assembly drawing when mounting the pick-up in the transportation mechanism. No special adjustment such as skew adjustment or grating angle adjustment is required. The metal bearing of Cu-compound sintered alloy is impregnated with oil. You do not normally need to lubricate the bushing. If you need to lubricate, use Hydrofluid EP-56 (Mitsubishi Oil).

2) Harness and connector

Use the specified connector housings for electrical connections. Care should be taken to see that the connector of the LD harness is clamped tightly, since a loose connection may cause a serious damage to the LD. There may be a deterioration in the eye pattern if a digital noise source such as a microcomputer is positioned near the PD harness.

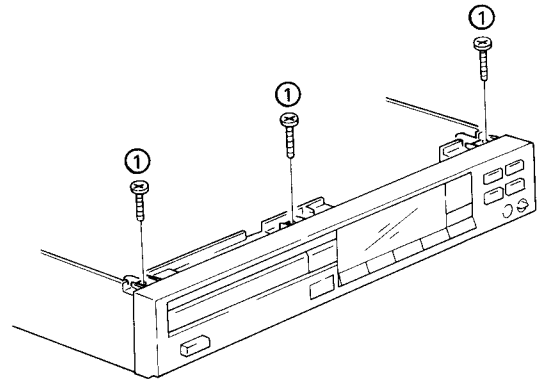
3) Safety regulations

This pick-up is designed to meet general safety regulations. For the pick-up as installed in a set to be certified as meeting the safety regulations of a particular country, however, application will have to be made to the proper authorities.

DISASSEMBLY

• Removal of Top Cover

Remove two screws on the front and tow screws on the rear of Top Cover (23) and detach the Top Cover by means of lifting it.

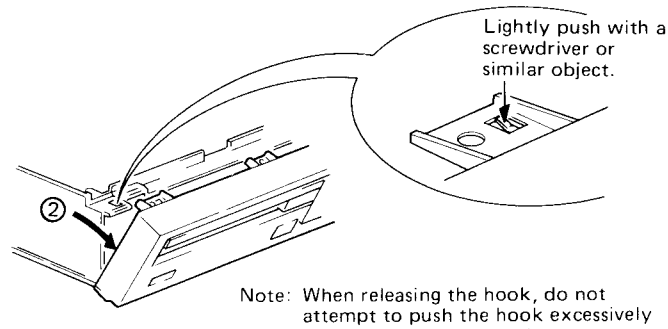


• Removal of Front Panel

① Remove three screws mounting the Front Panel (8).

② While pushing the hook on the upper left (or right) lightly, bring down the Front Panel in the direction arrow shows to release hook.

Note: When reassembling the Front Panel, confirm that the two hooks on the upper and two hooks on the lower side firmly catching the Front Panel by means of shaking the Panel back and forth.

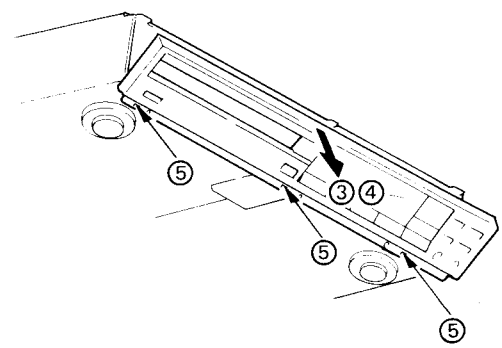


Note: When releasing the hook, do not attempt to push the hook excessively hard as this may invite damage to the hook.

③ The same manner as to step 2 , while lightly pushing the hook on the upper right (or left), bring down the Front Panel and release hook.

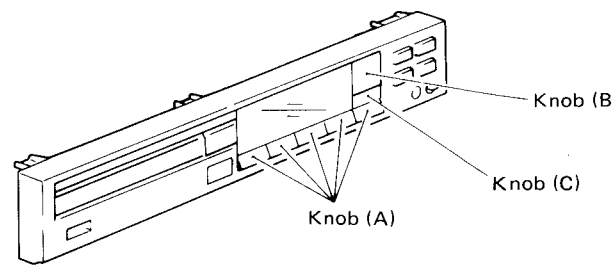
④ While pulling the released upper part of Front Panel in the direction arrow shows, place the rear of the unit downward to stand it.

⑤ Lightly push the hooks on the lower part of the Panel one by one from the side to release and detach the Front Panel.



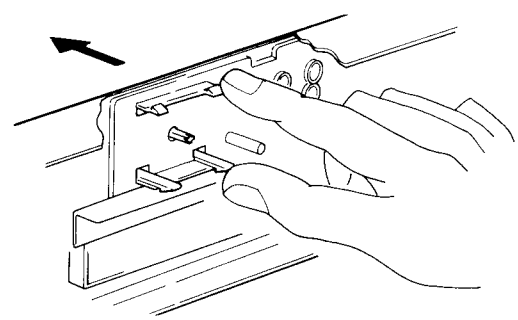
• Removal of Knobs

Remove the Front Panel.

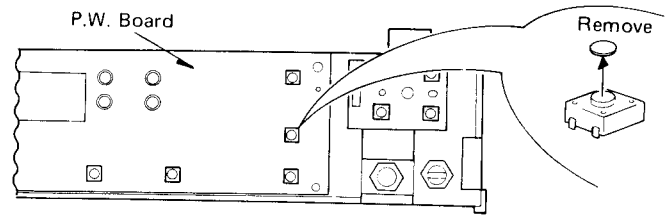


(1) Knob (B)

Place the rear side of Front Panel frontward, pinch the hooks of Knob (B) and push them lightly to the arrow direction as illustration shows to detach.

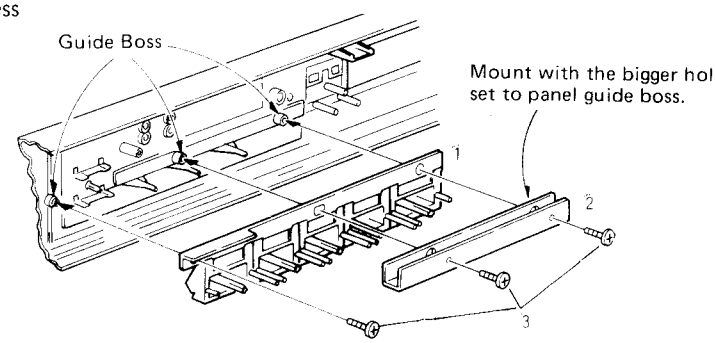


(2) Knob (C)
Follow the same procedure as to (1) to detach. If no switching tactual is felt and Knob (C) becomes pressed state after replacement, check to see that a transparent sheet (ϕ4, thickness: 0.1) using as the former knob (C) countermeasure is stuck on the switch or not. Remove it when pasted.



• Attaching of Knob (A)

① Place the rear side of Front Panel frontward, Insert three guide bosses of Front Panel into the guide holes of Knob (A).
② Insert the guide bosses of Front Panel into the press bar guide holes and tighten with two screws.
③ Fasten three screws (3 x 8 mm CBTS-P).



• Removal of Mechanism Unit (Refer to page 31)

The Mechanism Unit can be removed after removing the Front Panel.

(1) Remove screw (56) on the rear of loader and disassemble the loader stopper (41).
(2) Unfasten screw (64) securing the leaf switch (47) on the right hand side of Mechanism Unit to detach.
(3) Draw loader unit frontward to detach.
(4) Remove four screws (51) tightening Mechanism Unit. Hold the rear of the Unit and pull it out diagonally to rear to dismantle.

• Removal of Mechanism Unit Parts (Refer to page 31)

Refer to the exploded view of Mechanism Unit and the following instructions, replace pick-up, slide motor, and spindle motor.

(1) Remove 2 mounting screws (65) for the housing (8) a detach the housing from the mechanism plate (1).
(2) Unfasten two mounting screws (34), (63) for the servo P.W.B. and dismantle the P.W.B.
(3) To replace pick-up (10), remove four screws (54) on the both sides of slide shaft (12), and disassemble pick-up with the slide shaft from the housing (8). Do not over tighten the screws (54) when remounting.
(4) To replace slide motor (3), remove spring (7), 3-E ring (52), and helical gear (6).
(5) Next, remove 2 mounting screws (51) of the slide motor (3) and detach the slide motor with the worm gear (4).
(6) To replace spindle motor (9), unfasten a mounting screw (61) for the turntable (13).
(7) Next, remove 2 mounting screws (53) for the spindle motor and detach the spindle motor from the housing. In addition when remounting the turntable, refer to the "Turntable Height Adjustment" and adjust it properly.

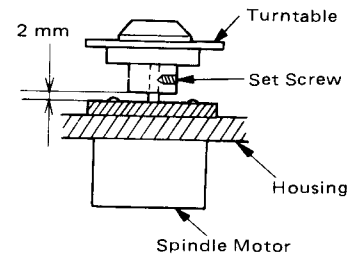
ADJUSTMENT OF MECHANISM UNIT

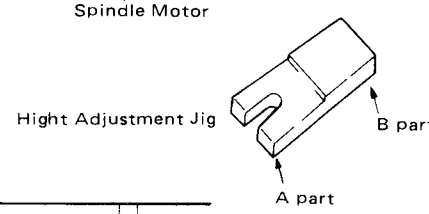
• Turntable Height Adjustment

① Attach the turntable to the spindle motor.
② To adjust the height in 2 mm, insert "A" part of the jig between the upper surface of the housing and the lower surface of the turntable.
③ When it is adjusted to 2 mm, tighten the set screw.

About the height adjustment jig

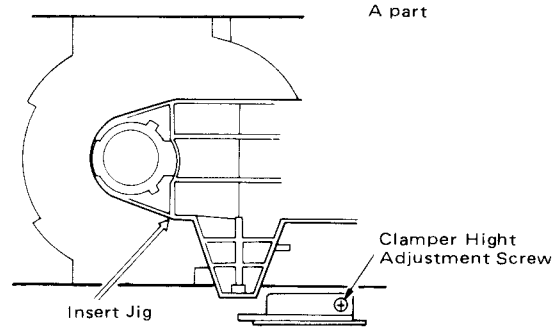
As illustration shows, the jig to be used for the height adjustment is prepared. The part indicated "A" for turntable height and "B" for clamper arm height adjustment. In order easier for the adjustment, place the laser pick-up away from the turntable and insert the jig between the housing and the turntable before attempting the adjustment.

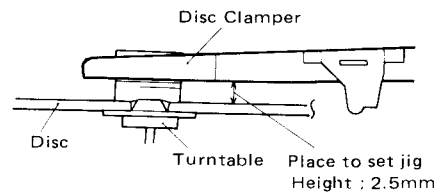




• Clamper Arm Height Adjustment

① Load a disc onto the turntable.
② To adjust the height between the disc and disc clamper in 2.5 mm, insert "B" part of the jig into the portion indicated in the illustration.
③ After adjusting it to 2.5 mm, fasten the clamper height adjustment screw.





MAINTENANCE AND ADJUSTMENT PROCEDURE

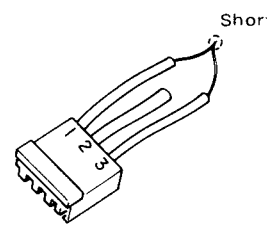
For necessary operations to perform part replacement, repairing, and adjustment, it is feasible by using of operation buttons normally used for playing to adjust tracking, focus, etc. of the laser pick-up. because of a service software (service mode) is programed to a microcomputer employed in this model.

Hereafter the adjustment procedures for each circuit checking and servo system adjustment are explained as the unit is set to service mode condition except for specified case.

1. Setting of Service Mode

- Turn off the power (do not load a disc).
- Remove top cover for confirming of inside.
- Short-circuit pins ① and ③, TP-204 of signal processing P.W.B. (KU-5740). It is convenient to use a connector like one the illustration shows.

  Note: Never short-circuit TP-204 after the power turned on.
- By turning on the power, " 00 " blinks on the indication window showing service mode.
- On this state, all buttons' functions for normal playing are inoperative and the disc tray can not be opened or closed.



Short-circuit Connector Jig

2. NOTES ON OPERATION BUTTONS IN SERVICE MODE

(1) Play Button (▶ PLAY)

Each push of the button to actuate the following servo circuit operation in consecutive order. Pushing it four times actuates all servo operations.

- Push it once : Actuate focus servo circuit
- Push it twice : Actuate spindle servo circuit
- Push it three times : Actuate tracking servo circuit
- Push it four times : Actuate slide servo circuit

When focus servo operation is defective, it will not go to the next step however the button is pressed.

(2) Stop Button (■ STOP)

Pushing the button to cancel all circuit operations. To check servo circuit again or recheck from the beginning, put it.

(3) Track Button (⏮ ⏭)

In service mode, this button has two functions.

① In stop state (include the condition after the power is turned on):
The pick-up slides.
While pushing " ⏮ " side, pick-up moves to disc center; while pushing " ⏭ " side, it moves to disc outer circle.

② In the state when play button (▶ PLAY) is pressed four times and all servo circuits are activated:
Performs track jump.
There are three types of track jump (1, 10, 100 tracks) and are switchable by pause button (❚❚ PAUSE).

- Except for the above two conditions, this button will not function even if it is pressed.
(An example: In such a case when the play button is pressed three times and the servos are activated up to tracking.)

- Pushing the track button (⏮ ⏭) while all servo circuits are activated makes the tracking servo gain lowered.
Note that the adjustment of tracking servo explained later must be performed under the tracking servo is in high gain. To put it in high gain condition, turn off the power once and turn on again, then activate all servo circuits.

(4) Pause Button (❚❚ PAUSE)

Switches track jump mode.
It is always reverted to 1 track jump mode whenever the power is turned on.
Each push of the button shifts the mode to 10-track, 100-track, 1-track . . . , but no mode indication is displayed.
Confirmation of track jump mode can be obtained by the time width of tracking error signal.

3. CHECKING OF FOCUS, SPINDLE, TRACKING, AND SLIDE SERVO OPERATIONS

- Be sure to observe the preceding "Turntable Height Adjustment" at the time removed the turntable or in case of disc hit the tray.
Also when replaced the parts, be sure to do the following servo system adjustments prior to these adjustments.

(1) Turn off the power and disconnect the jumper to pins ① and ③ of TP-204. Then turn on the power and operate disc holder open-close button (⏏ OPEN/CLOSE) to load the standard disc.
Note: When TP-204 is shorted, disc holder can not be opened or closed even though the disc holder open/close button is pressed. Displace the lock arm from the lock point enables loading of disc by drawing the disc holder frontward manually. In this case, turning on and off the power is not essential.

(2) Short-circuit pins ① and ③ of TP-204 and turn on the power. Check to see that " 00 " blinks on the indication window.

(3) Checking of Focus Servo Operation.
Pushing the play button (▶ PLAY) starts focus search. When the disc is loaded, by detecting of a focusing point of the laser beam on the disc surface to activate focus servo.
When the disc is not loaded, repeats focus search three times and the returns to the former state (the condition before pushing the button).
When the button is continuously pushed, repeats focus search with or without loading of the disc. When the button is released, starts detecting a focusing point within the three times of search operation.
In case of focus servo is properly worked, the position of object lens of laser pick-up becomes approximately the same height as actuator cover.
Confirmation of the proper focus servo operation can be checked by a "squeak" sound reproduced when turning the disc clockwise or counterclockwise with the hand lightly.
This sound derives from the movement of actuator for focus servo, so checking of this sound namely to confirm proper operation of focus servo.
Note: Confirming up and down movements of object lens enables checking of focus search operation. Remove the disc and detach the disc clamper so as to look object lens movement more easily, then push play button (▶ PLAY). The object lens repeats moving three times up and down then stops. Through this movement the operation of actuator for focus control can be checked.

(4) Checking of Spindle Servo
After checking the focus servo, push play button (▶ PLAY) again. The disc starts to run.
With this revolution of disc, the servo operation can be confirmed.

Note: If the disc does not run due to spindle servo malfunction or runs fast, the following "Checking of Tracking Servo" will be impossible.

(5) Checking of Tracking Servo
Push play button (▶ PLAY) again.
When tracking servo is properly operated, a "Sizzle" sound from the operation of tracking actuator of laser pick-up will be produced.

Note: Same as previous column, if it is not properly operated the following checking will be impossible.

(6) Checking of Slide Servo
Note: Before checking, prepare and insert a headphone into the headphone jack with a volume adjusted to adequate level.
Push play button (▶ PLAY) again.
When slide servo is properly operated, the sound will be heard through the headphone.
This sound not always be heard normally, for many instances it will be heard as if it is muted.

Note: If there is no sound, the laser pick-up may be set at disc's lead-in or lead-out position. For this case, move the laser pick-up to the program are referring to the column 4.(5) ②.

(7) Checking of Playback Sound
- Connect the line-out of this unit to an appropriate amplifier so that the playback sound can be checked.

Push either side of track button (⏮ ⏭).
In this state tracking servo becomes low gain and the unit becomes normal playing condition.

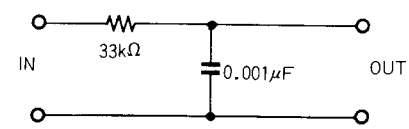
(8) Checking of General Functions
Turn off the power and disconnect the jumper to pins ① and ③ of TP-204.
Turn on the power and check all playing controls for proper functions.

Note: Because of a timing of the microcomputer employed in the unit, occasionally it does not accept a command from the button.
In this case do not judge it for defective, repeat the same check for several times.

4. ADJUSTMENT

(1) Before Adjustment.
Adjustment order is, first to adjust turntable height, etc. at the time complete assembling, secondly to adjust electrical adjustments for laser pick-up system and spindle motor system to complete.
The adjustment of the super-linear converter employed in this unit aiming to reduce a distortion at the time of D/A conversion is unnecessary except for special occasion.

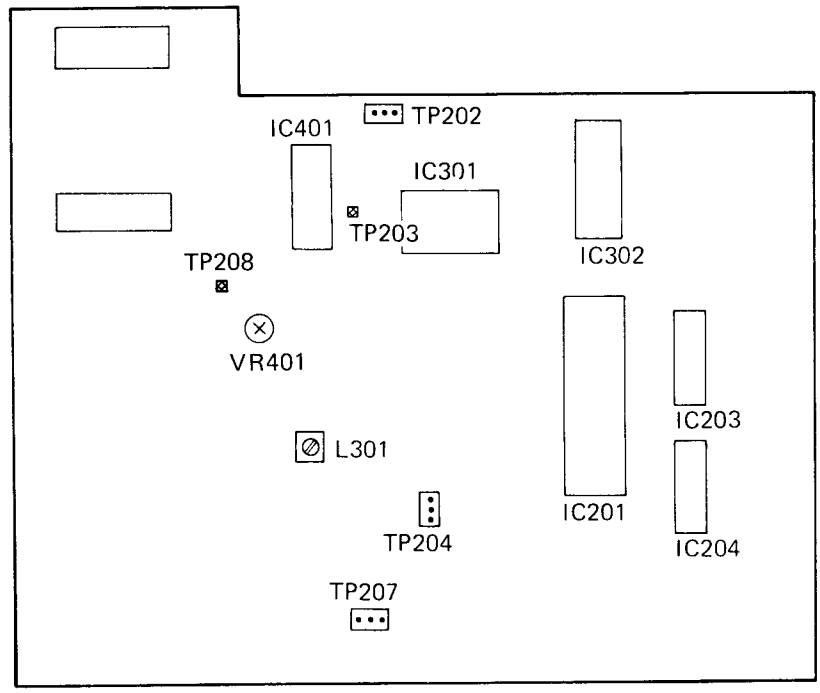
(2) Measuring Equipments and Implements for Adjustment
① Dual-mode oscilloscope
② Specified disc for adjustment
③ Measuring filter



④ Audio frequency oscillator
10 kHz, 3 Vp-p output maximum
⑤ Frequency counter
Count up to 5 MHz minimum
⑥ Connector with wires for signal pick-up
6p 1 each
3p 2 each
⑦ Headphones
Checking of playback sound

(3) Preparation

Signal Processing PWB Location of Terminal for Adjustment



① Be sure that the power is off state.
Short-circuit pins ① and ③, TP-204 of signal processing P.W.B. (KU-5740) and set the unit to service mode.

② Remove disc clamper by means of drawing the disc holder of mechanism unit frontward.
(Manually move the lock arm fitted with side of the disc holder, release the lock of tray, and draw the disc holder frontward.)

③ Connect the wires of signal pick-up connectors to TP-101 (6P) and TP-102 (3P).

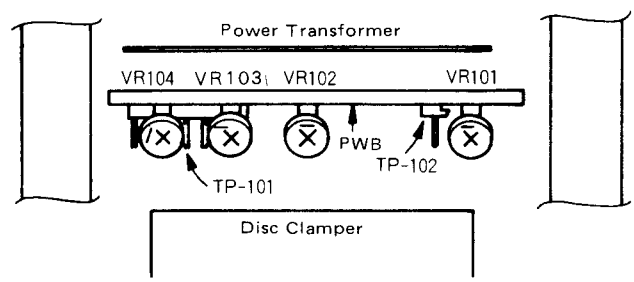
④ Mount the disc clamper removed in step 2. Leave the disc holder drawn frontward.

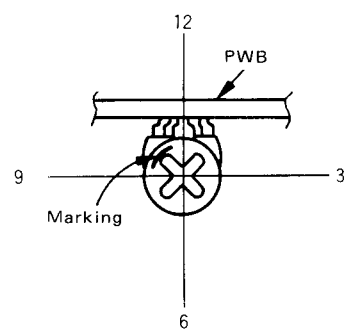
⑤ Set the adjustment VRs on the servo P.W.B. (KU-5720) of mechanism unit at the following positions. Observe the marking of VR and set them to preset positions.

VR101 (330 kΩ) → 12 O'clock
VR102 (47 kΩ) → 12 O'clock
VR103 (10 kΩ) → 11 O'clock
VR104 (10 kΩ) → 10 O'clock

⑥ That is all to complete preparations. Following is the adjustment order.

1. PLL
2. Tracking offset
3. Focus gain
4. Focus offset
5. Tracking gain
6. Tracking offset recheck



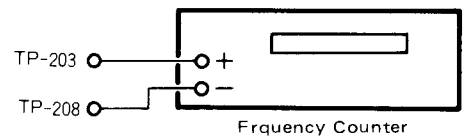


(4) Adjustment of PLL

① Preparation

- Turn the power off.
- Do not load the adjustment disc.
- Check to see that the lazer pick-up is set at inner circle of program area (To move pick-up, refer to (5)②).
- Check to see that the unit is in service mode (Short-circuit pins ① and ③, TP-204 of signal processing P.W.B.).
- Short-circuit pins ① and ②, or ② and ③, TP-202 (3P) of signal processing P.W.B. (KU-5740).
- Short-circuit pins ① and ②, or ② and ③, TP-207 (3P) of signal processing P.W.B.
- Turn the power on.
- Confirm that " 00 " blinks on the indication window.

② Connection of measuring equipment.



- Connect positive ⊕ side of the frequency counter to TP-203 and negative ⊖ side to TP-208.

③ Adjustment

- Rotate L-301 with a non-magnetic screwdriver and obtain 4.32 MHz ± 20 kHz PLL frequency on the frequency counter (4.30 MHz ~ 4.34 MHz).

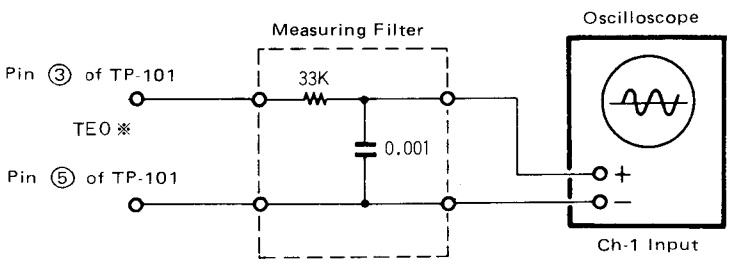
④ End of adjustment

- Turn off the power.
- Remove the short circuit at TP-207 (remove shorting connector).

Note: Do not remove the short circuit at TP-202 as this is required in next servo system adjustment.

(5) Adjustment of Tracking Offset

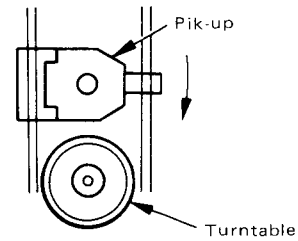
① Connection of measuring equipment



※ TEO: Track error out

② Use track button (⏮ ⏭) to move the laser pick-up close to turntable and place it to program area (recorded portion) near turntable side by the eye.

Note: All adjustments hereafter require the pick-up position set in the program area (recorded portion) however, recommend the pick-up be set at inner circle of disc to avoid increasing of effects due to warp and eccentricity in the outer circle of disc.



③ Load the adjustment disc and close the disc holder manually.

- Check to see that the power is turned on and the unit is in service mode.

④ Adjustment

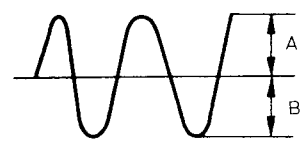
With a sufficient time interval in between, push play button (▶ PLAY) twice and make the focus servo and spindle servo activated. Disc starts to run (refer to 2.(1) and 3.(3) ~ (6)).

- Terminate the input terminal of oscilloscope to the ground and set the horizontal base line to the center of oscilloscope scale. When it is set, select the input of oscilloscope to DC range.
- Observe a waveform by setting the oscilloscope:—

  Input 0.1 V (use 10:1 probe)

  Sweep time 1 msec. or 2 msec.

Adjust VR101 so as to obtain the height of waveform A and B becomes even as shown in illustration.



(6) Adjustment of Focus Gain

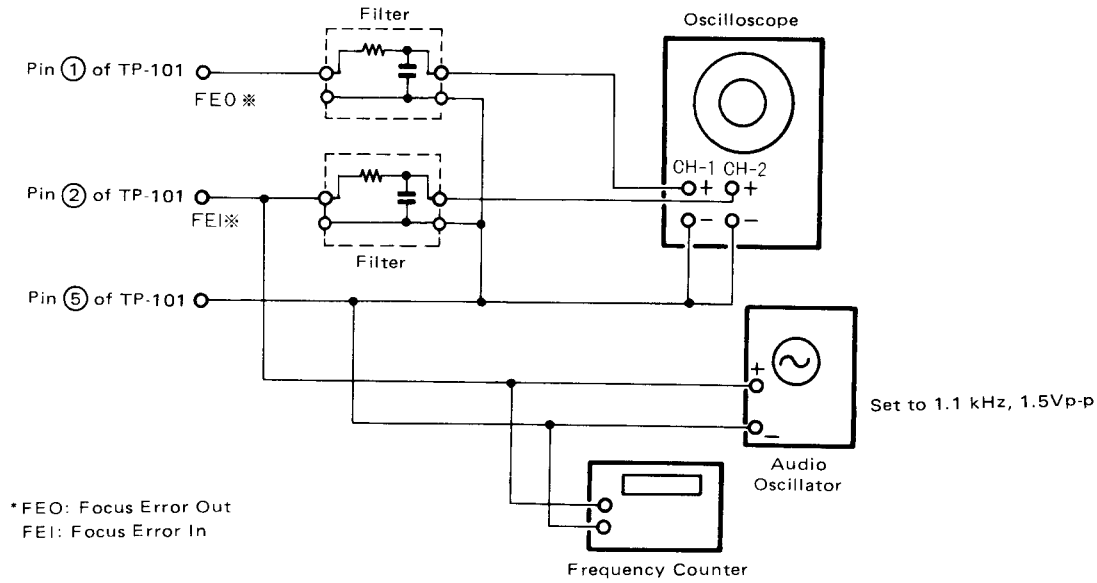
① With a sufficient interval of time in between, push play button (▶ PLAY) twice to activate tracking servo and spindle servo.

② Plug in the headphone and make sure the playback sound is heard prior to the adjustment.

③ Connect of measuring equipment

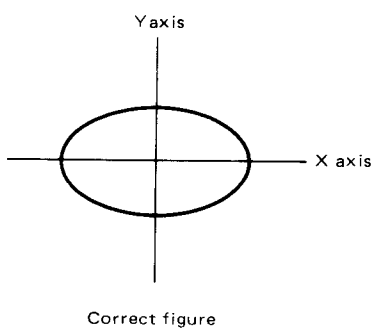
Connect the measuring equipments as per illustration.

Note: Before connecting the oscillator check the operation of servo (produce sound).

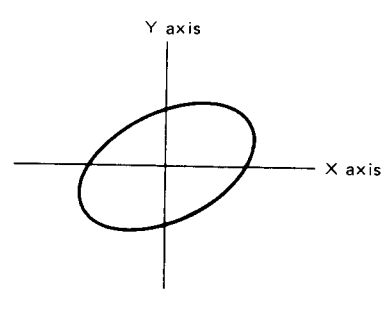


④ Adjustment

- Set the output of audio oscillator to 1.1 kHz, 1.5 Vp-p (±0.1 V).
- Prepare and connect two filters as per illustration.
- Select oscilloscope input so to observe Lissajous figure. (Select DC range both X and Y inputs.)
- Adjust VR-103 and obtain Lissajous figure symmetirc to X and Y axes. (Adjust the phase of two inputs to 90°.)



Correct figure



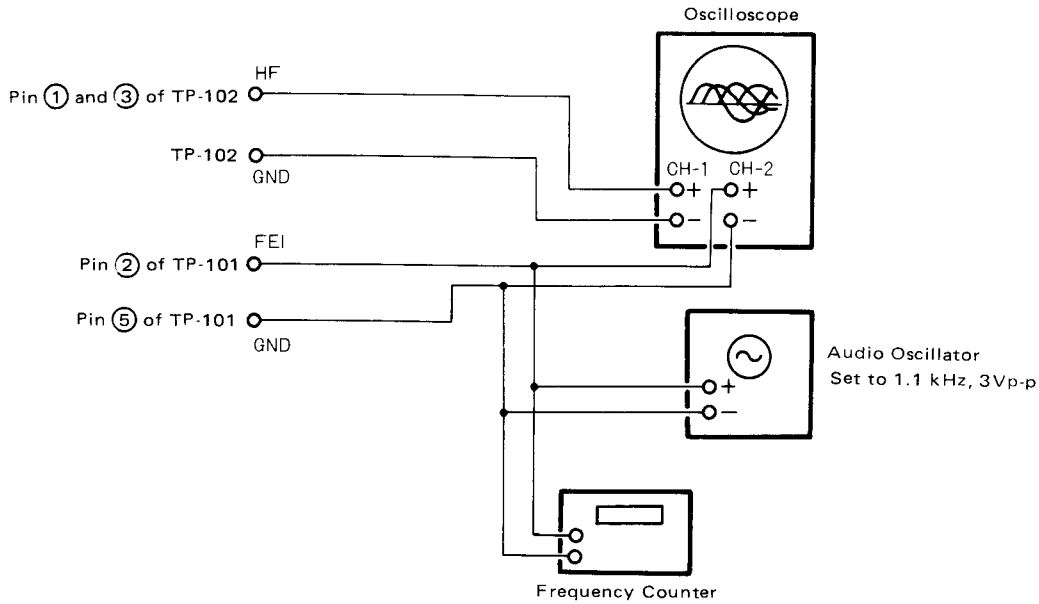
Incorrect figure

(7) Adjustment of Focus Offset

① Adjust it in the same condition as to focus gain except the measuring equipment connections.

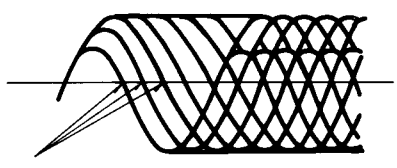
② Connection of measuring equipment

Note: Audio oscillator should be connected during the servo operation.

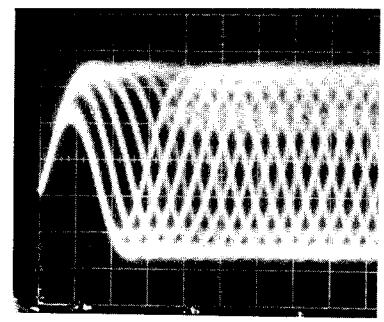


③ Adjustment

- Set the output of audio oscillator to 1.1 kHz, 3.0 Vp-p (±0.1 V).
- Select oscilloscope input mode at "ALTERNATE" or "CHOPPER" and set it to 50 mV/DIV or 20 mV/DIV (use 10:1 probe). Observe by setting the sweep time to 0.2 or 0.5 μs range.
- A waveform to observe in this time called "Eye Pattern".
- Adjust VR-102 for a minimum jitter amount.



Adjust A portion for most fine waveform.



(8) Adjustment of Tracking Gain

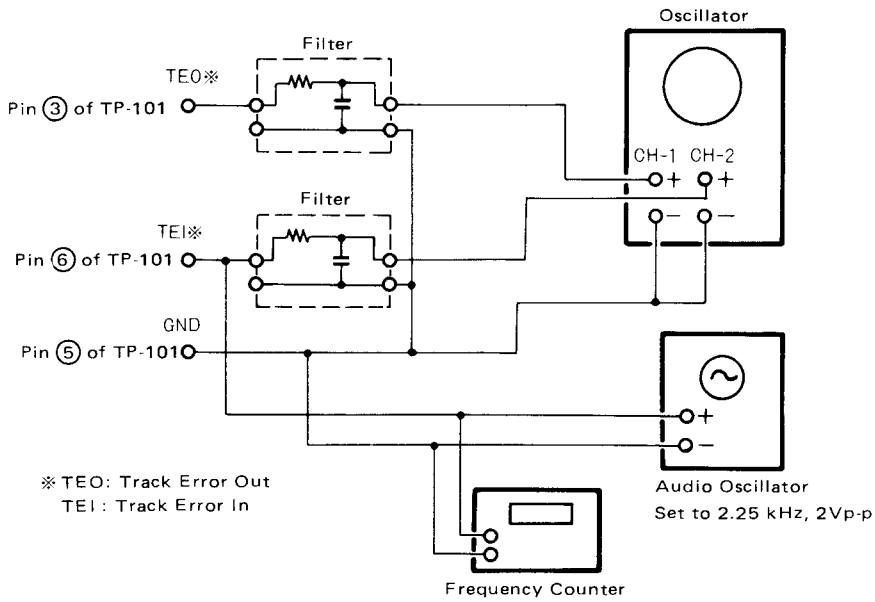
① Adjust it in the same condition as to focus gain except the measuring equipment connections.

② Aduio oscillator should be connected while the servo is in operation.
If the connection is made before servo operation, causing mis-operation.
If the connection is made in failure, disconnect oscillator, push stop button (■ STOP) to stop all operations, and follow the steps from the beginning.

③ Connection of measuring equipment.

④ Adjustment

- Set the output of audio oscillator to 2.25 kHz ± 120 Hz 2 Vp-p ±0.1 V.
- Connect two filters as per illustration.
- Select oscilloscope input so to observe Lissajous waveform. (Select DC range both X and Y inputs.)
- Adjust VR-104 and obtain Lissajous waveform symmetric to X and Y axes. The waveform is the same as focus gain adjustment.



(9) Checking of Tracking Offset

① Check the adjustment performed in the previous column (5).

- Push stop button (■ STOP) to stop disc revolution.
- With a sufficient interval of time in between, push play button (▶ PLAY) twice and check that the disc starts to run.

Note: The microcomputer employed in the unit sometimes does not accept button operation. If so, push the button again.

- Observe a waveform and check that the height of upper and lower waveform are even. (Reference value: Difference of height between two is 5% or less.)
- If the difference is beyond the value, adjust VR-101.

② That is all to complete adjustments.

- Remove the signal pick-up connector with wires from TP-101, 102 on the mechanism unit P.W.B. (KU-5720). (It is necessary to pull out the disc holder and remove the disc clamper. Refer to column (3).)

FUNCTION OF IC TERMINAL

• Remote Control IC LU59001

Terminal No.	Function	Terminal No.	Function
1	Data output.	11	Remote control code input. Receivers code from RM557.
2	Data output.		
3	Data output.	12	System address, ground.
4	Data output.	13	System address, ground.
5	Data output.	14	System address, ground.
6	455 kHz osc.	15	System address, ground.
7	455 kHz osc.	16	Data output.
8	Ground.	17	Data output.
9	ACL (Auto Clear). Receivers High (+5V) from IC201 for 15 msec. at the time of turning the power on, normally Low (0V).	18	System address, +5V.
		19	Break in signal to main microcomputer (HD6305X0A53) IC201.
10	Ground	20	V_{DD}, +5V

• Table of LU59001 Date output

Dateof LU59001 when "KEY IN" by remote control.

Note: 0 : 0V
1 : 5V

Terminal No. of LU59001

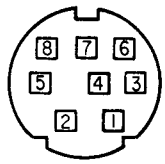
Key of Remote Control (RC-1100)		12	14	15	18	13	1	2	4	5	16	17	19	3
		System Address					Date						Expand Date	
		C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8	C 9	C 10	C 11	C 12	C 13
1	1	0	0	0	1	0	0	1	0	0	0	0	1	0
2	2						1	1	0	0	0	0		
3	3						0	0	1	0	0	0		
4	4						1	0	1	0	0	0		
5	5						0	1	1	0	0	0		
6	6						1	1	1	0	0	0		
7	7						0	0	0	1	0	0		
8	8						1	0	0	1	0	0		
9	9						0	1	0	1	0	0		
10	0						1	1	0	1	0	0		
11	+10						0	0	1	1	0	0		
12	PROGRAM						1	0	1	1	0	0		
13	VOLUME+						0	1	1	1	0	0		
14	VOLUME−						1	1	1	1	0	0		
15	OPEN/CLOSE						0	0	0	0	1	0		
16	CLEAR						1	0	0	0	1	0		
17	CALL						0	1	0	0	1	0		
18	DISPLAY	↓	↓	↓	↓	↓	1	1	0	0	1	0	↓	↓
19	REPEAT	0	0	0	1	0	0	0	1	0	1	0	1	0
20	A-B						1	0	1	0	1	0		
21	INDEX						0	1	1	0	1	0		
22	DIRECT						1	1	1	0	1	0		
23	TRACK ▶▌						0	0	0	1	1	0		
24	TRACK ▐◀						1	0	0	1	1	0		
25	SKIP ▶▶						0	1	0	1	1	0		
26	SKIP ◀◀						1	1	0	1	1	0		
27	PLAY						0	0	1	1	1	0		
28	PAUSE						1	0	1	1	1	0		
29	STOP	↓	↓	↓	↓	↓	0	1	1	1	1	0	↓	↓

Input

Output

FUNCTION OF SUB CODE OUTPUT TERMINAL

- **Sub-code Output Terminals**



1 . EXCK
2 . SBSO
3 . SUBQ
4 . SCOR
5 . $\overline{\text{WFCK}}$
6 . CRCF
7 . NC
8 . MUTE

(5) $\overline{\text{WFCK}}$ Waveform

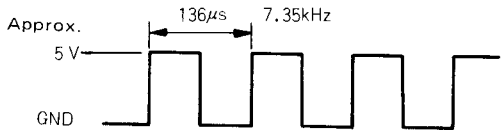


Fig. 1

(4) SCOR

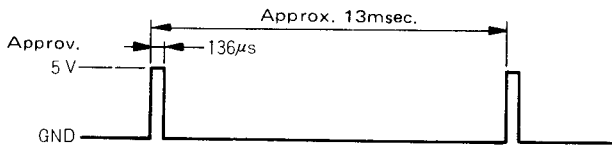


Fig. 2

(2) SBSO

Fig. 3 (No input to EXCK)

Waveform when applying $\overline{\text{WFCK}}$ signal to EXCK terminal.

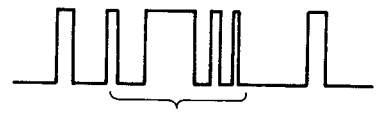


Fig. 4 Pulses (Input occurs to EXCK)

(1) EXCK

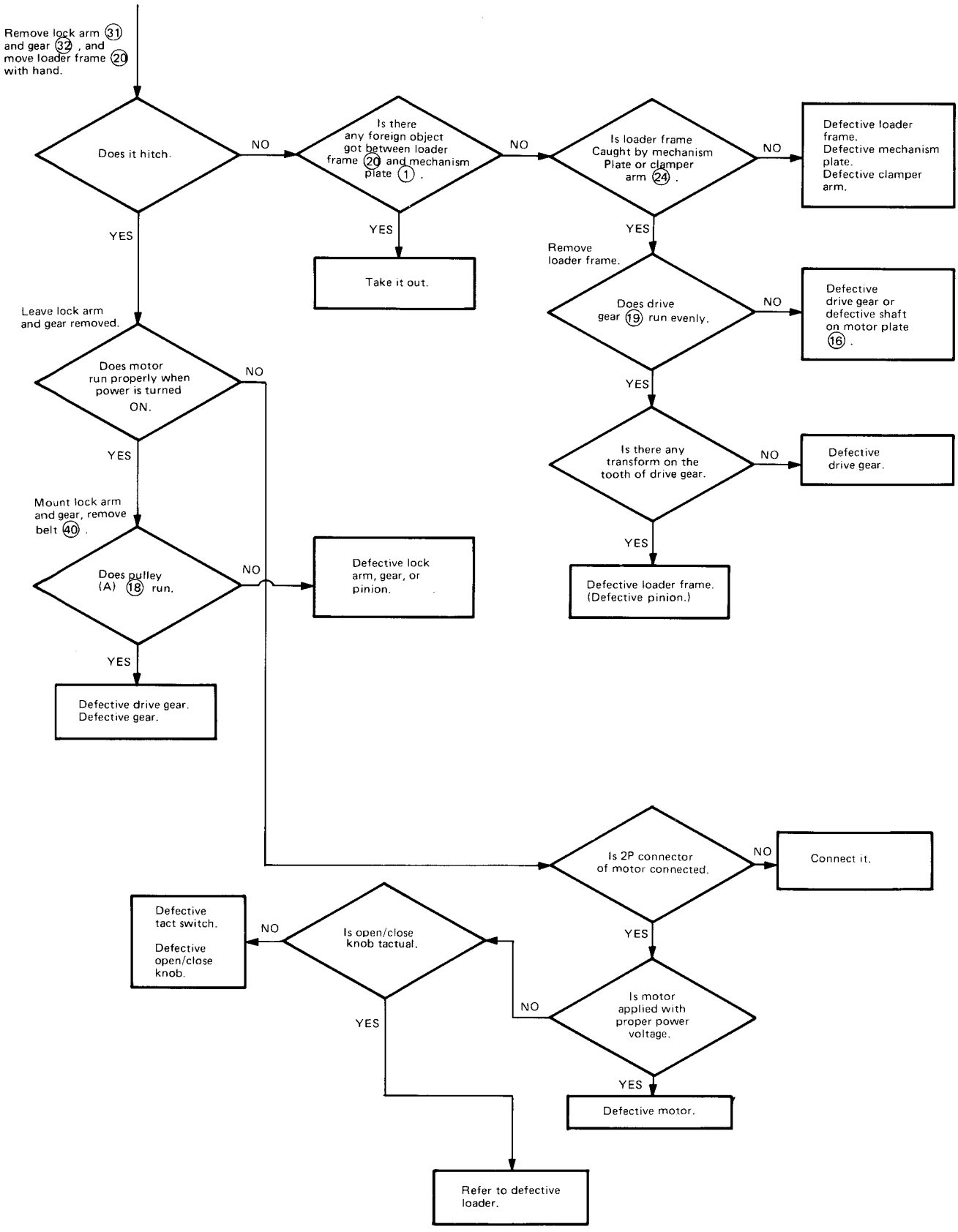
The waveform at SBSO terminal changes from Figure 3 to Figure 4 when applying $\overline{\text{WFCK}}$ signal to EXCK terminal.

(8) MUTE

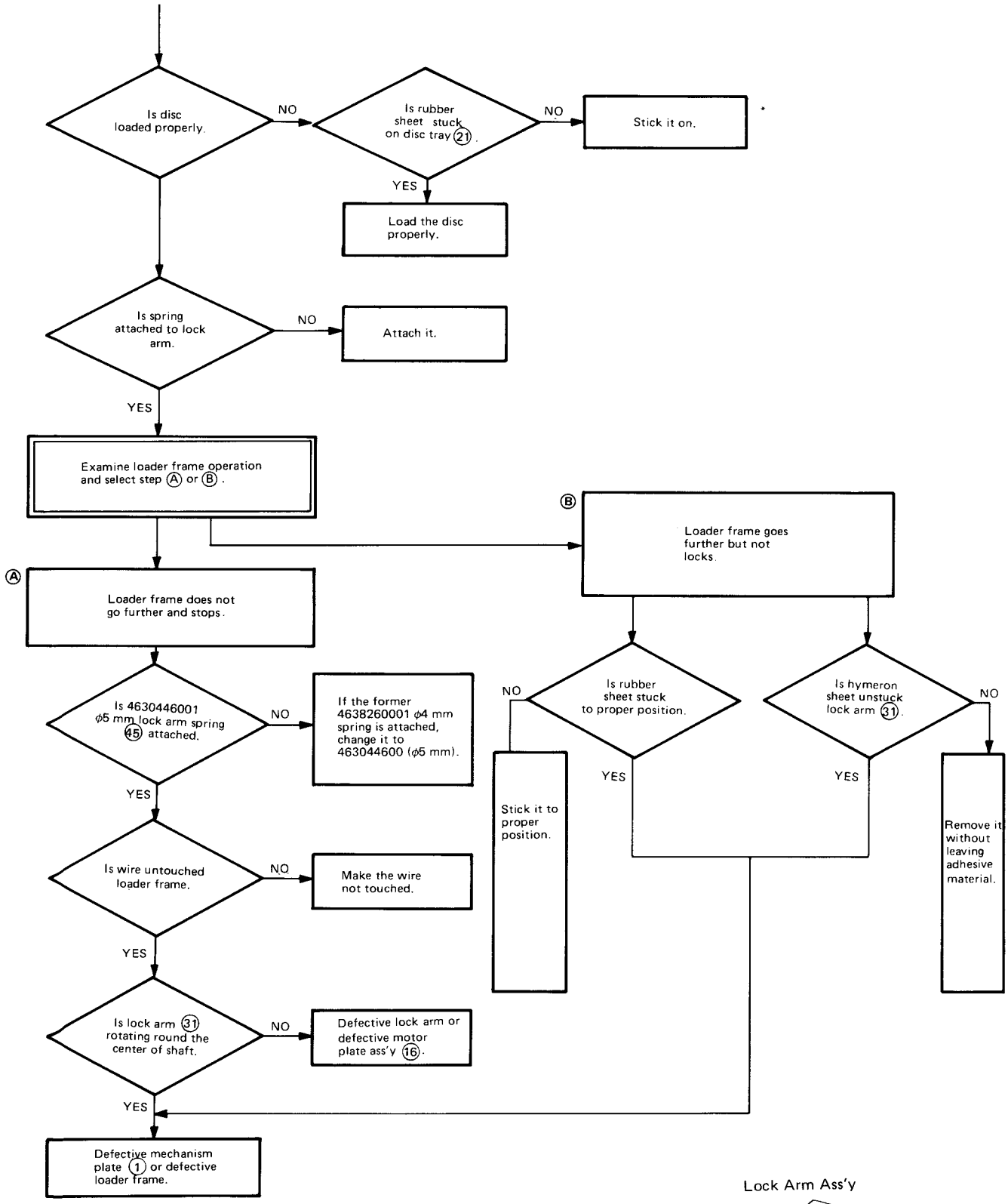
Low (0V) at PLAY, others High (5V).

TROUBLESHOOTING

1. LOADER FRAME DOES NOT OPEN OR CLOSE



2. LOADER FRAME NOT LOCKS WHEN IT CLOSED

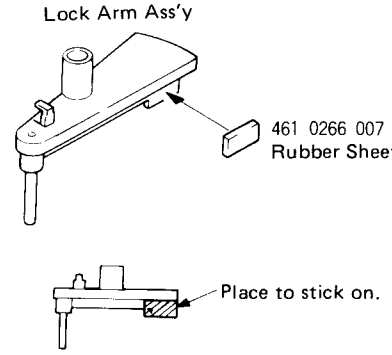

Is disc loaded properly.
NO
Is rubber sheet stuck on disc tray (21).
NO
Stick it on.
YES
Load the disc properly.
Is spring attached to lock arm.
NO
Attach it.
YES
Examine loader frame operation and select step (A) or (B).
(A)
Loader frame does not go further and stops.
(B)
Loader frame goes further but not locks.
Is 4630446001 ϕ5 mm lock arm spring (45) attached.
NO
If the former 4638260001 ϕ4 mm spring is attached, change it to 463044600 (ϕ5 mm).
YES
Is wire untouched loader frame.
NO
Make the wire not touched.
YES
Is lock arm (31) rotating round the center of shaft.
NO
Defective lock arm or defective motor plate ass'y (16).
YES
Defective mechanism plate (1) or defective loader frame.
Is rubber sheet stuck to proper position.
NO
YES
Stick it to proper position.
Is hymeron sheet unstuck lock arm (31).
NO
YES
Remove it without leaving adhesive material.

3. LOADER FRAME UNLOCKS WHEN TURNING ON THE POWER

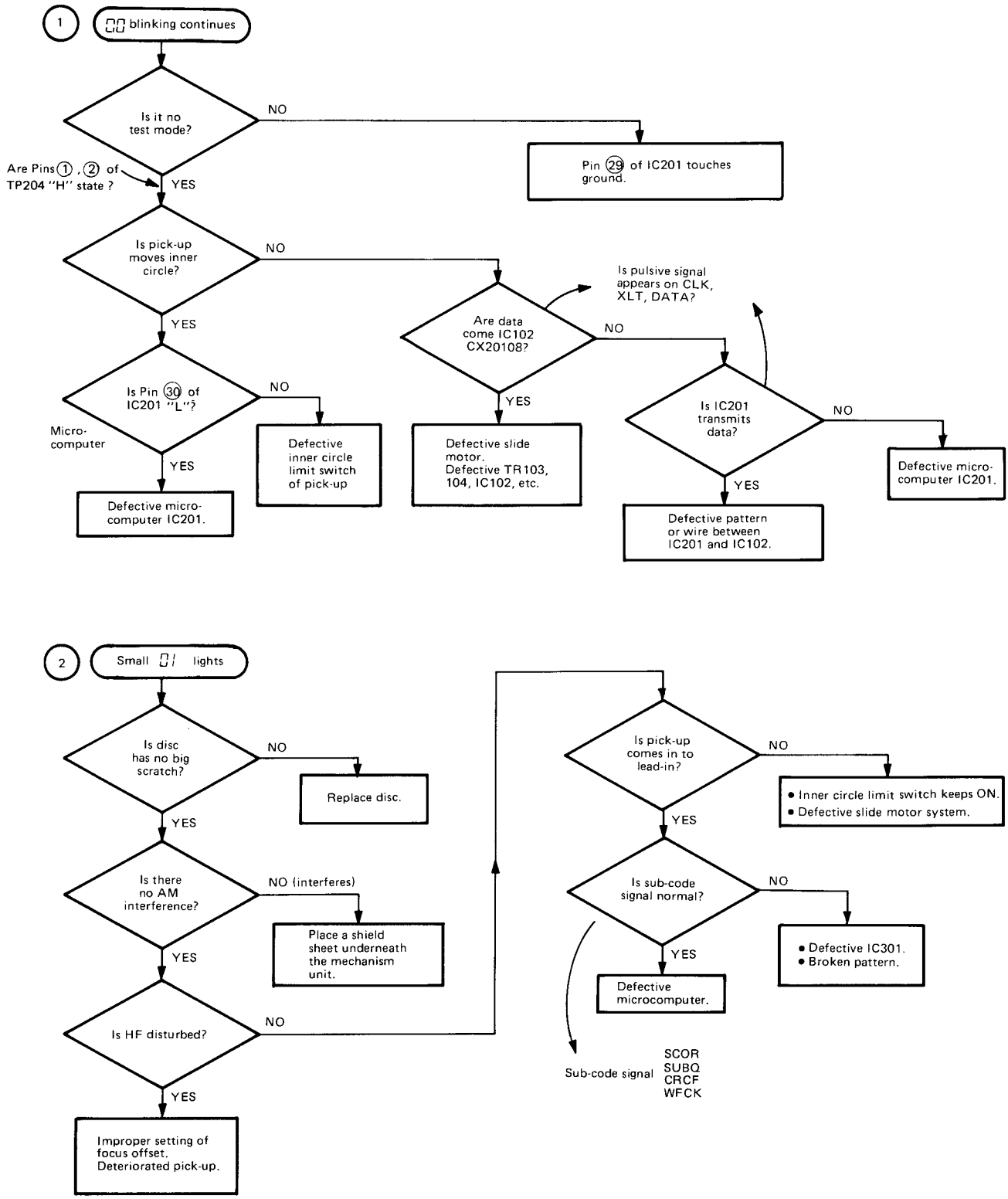
Follow the instruction 2. (B).

4. LOADER FRAME OPERATION MOMENTARILY RETARDS WHEN STARTING

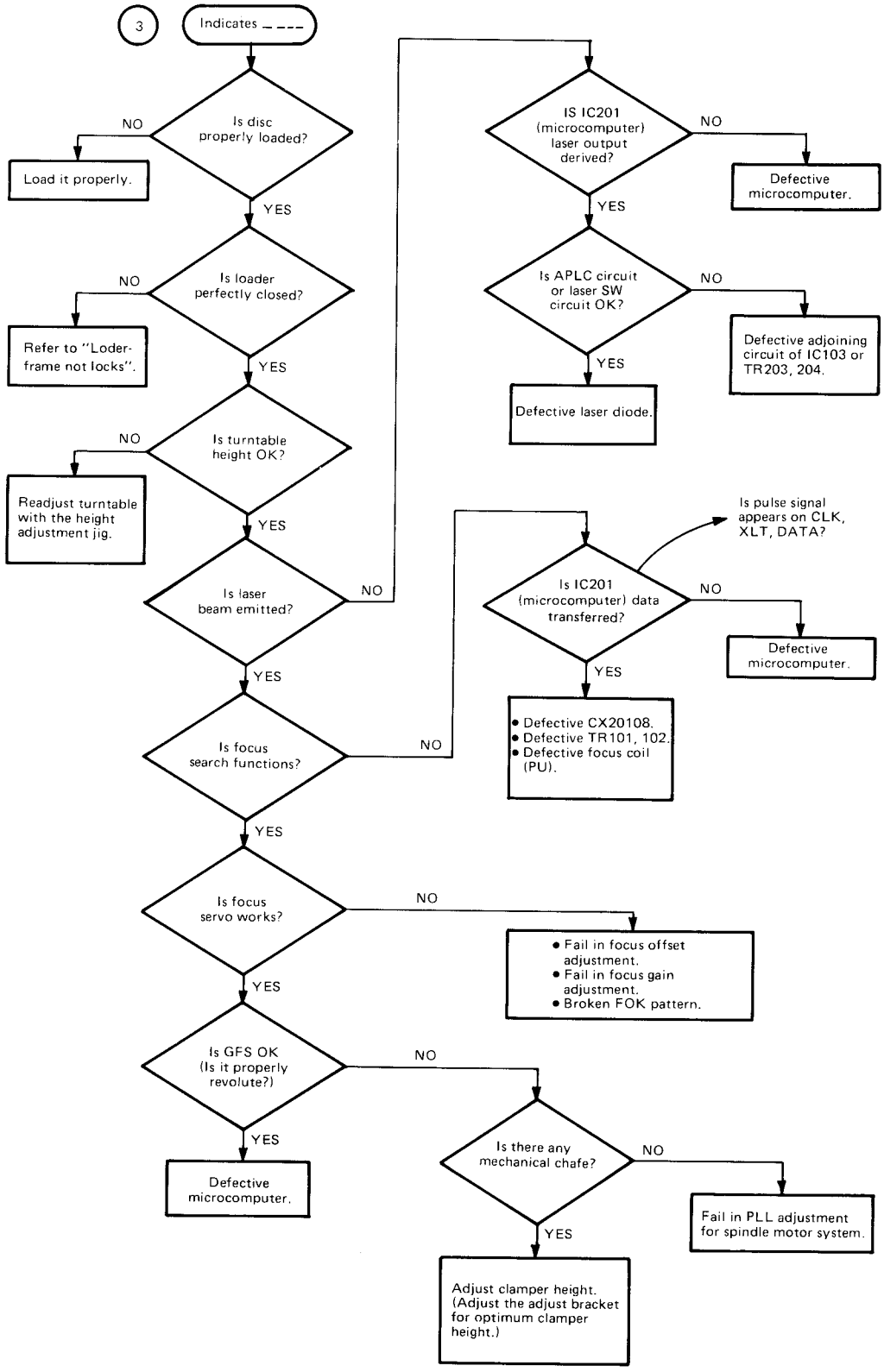
Stick 461026607 rubber sheet on the lock arm ass'y as per illustration.



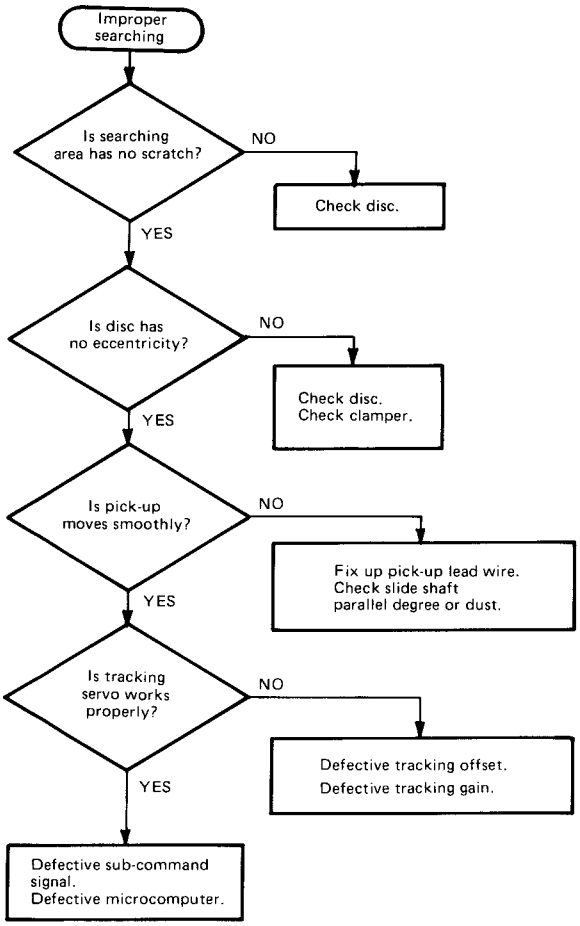
DEFECTIVE INITIAL OPERATION AT THE TIME OF DISC SETTING (1/2)

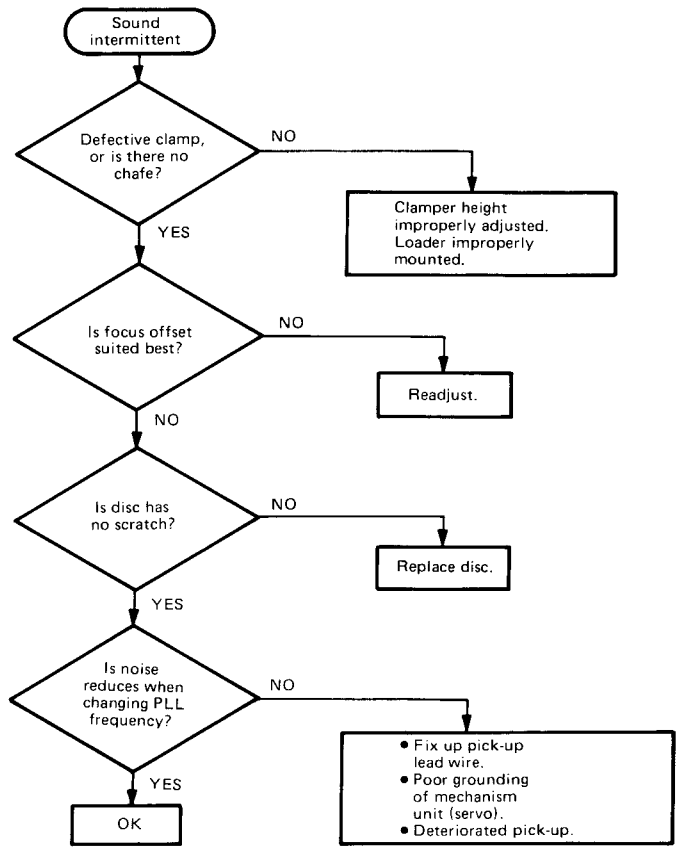


DEFECTIVE INITIAL OPERATION AT THE TIME OF DISC SETTING (2/2)

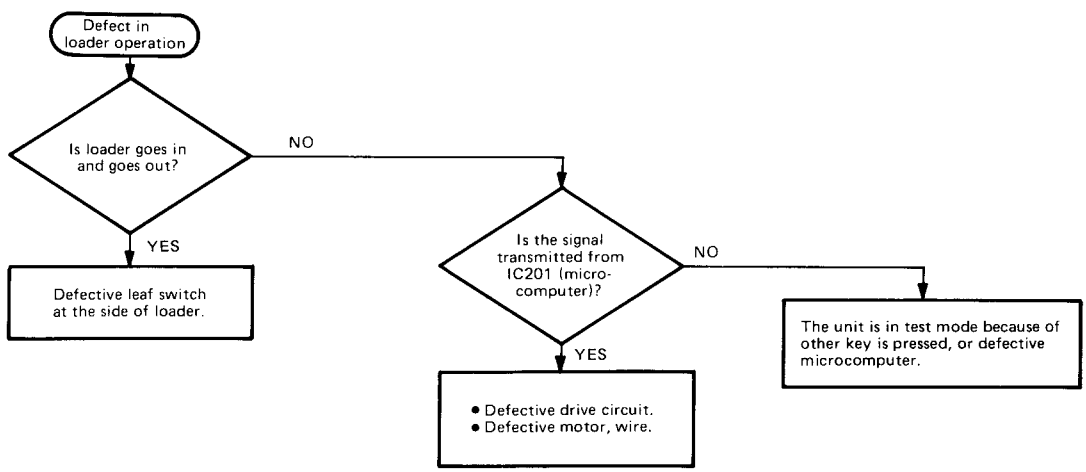


DOES NOT SEARCH (INCLUDING TAKES TIME TO SEARCH)





SOUND INTERMITTENT, LOADER IMPROPERLY WORKS


Defect in loader operation
Is loader goes in and goes out?
NO
YES
Defective leaf switch at the side of loader.
Is the signal transmitted from IC201 (micro-computer)?
NO
The unit is in test mode because of other key is pressed, or defective microcomputer.
YES
• Defective drive circuit.
• Defective motor, wire.

PARTS LIST OF P.W. BOARD

KU-5740 SIG PROC AUDIO UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP			
IC201	2620636001	HD6305X0(A53P)	
IC203,204	2630298002	LB1240	
IC251	2620635002	LU59001	
IC301	2620614007	CX23035	
IC302	2620554002	HM-6116P-4	
IC303,304	2630244001	NJM082D	
IC401	2620627007	PCM53JP-V-2	
IC402	2620522005	TC-4053BP	
IC403,404	2630360008	NE5532	
IC405	2620419008	HD14053BP	
IC406,407	2630257001	M-5218P	
IC408	2630198005	NJM4556D	
IC501	2630373008	NJM78M12A	
IC502	2630190003	NJM79M12A	
IC503,504	2630254004	NJM78M05A	
IC505	2630272002	NJM79M05A	
X251	2610037005	CSB455E	
LF401, 402	2610059012	L.P.F	
TR201 ~203	2730178006	2SC1740(R/S)	
TR204, 205	2710101022	2SA933(Q)	
TR206	2740036002	2SD468(C)	
TR251, 252	2730178006	2SC1740(R/S)	
TR301	2740036002	2SD468(C)	
TR302	2720025004	2SB562(C)	
TR303	2740036002	2SD468(C)	
TR304	2720025004	2SB562(C)	
TR305	2690015005	DTC124XS	
TR401	2730178006	2SC1740(R/S)	
TR402	2710101022	2SA933(Q)	
TR403	2730178006	2SC1740(R/S)	
TR404, 405	2730253015	2SC2878(A/B)	
D202	2760185027	HZ4B-2	
D203 ~207	2760049008	1S2076	
D208 ~210	2760370007	1SS106	
D501	2760405008	S1WB(A)10	
D503,504	2760049008	1S2076	
D505	2760405008	S1WB(A)10	
VD301	2760399004	KV1236	
RESISTOR GROUP			
VR401	EP-5462H1	SOLID VR (101)	100Ω
R455	2440040026	RS14B3A821JNBF	820Ω 1W
R501	2440089029	RS14B3D181NJBF	180Ω 2W
	2110459002	V1220Q25FA103	10kΩ

Ref. No.	Part No.	Part Name	Remarks
CAPACITOR GROUP			
C201,202	2533614000	CC45SL1H300J	30pF 50V
C203	2544147003	CE04W1H2R2=	2.2μF 50V
C204	2544130007	CE04W1A101=	100μF 10V
C205	2531024003	CK45F1H103Z	0.01μF 50V
C206	2544130007	CE04W1A101=	100μF 10V
C251,252	2533635005	CC45SL1H221J	220pF 50V
C301,302	2533610004	CC45SL1H200J	20pF 50V
C303	2544130007	CE04W1A101=	100μF 10V
C304	2531024003	CK45F1H103Z	0.01μF 50V
C305	2533617007	CC45SL1H390J	39pF 50V
C306	2551120042	CQ93M1H222J	2200pF 50V
C307	2533616008	CC45SL1H370J	36pF 50V
C308	2533633007	CC45SL1H181J	180pF 50V
C309	2551120042	CQ93M1H222J	2200pF 50V
C310	2544146004	CE04W1H010=	1μF 50V
C311	2544162020	CE04W1A471M	470μF 10V
C321,322	2551120084	CQ93M1H472J	4700pF 50V
C323	2561034050	CF93A1H683J	0.068μF 50V
C324	2544146004	CE04W1H010=	1μF 50V
C401,402	2544136001	CE04W1C101=	100μF 16V
C403	2544130007	CE04W1A101=	100μF 10V
C405,406	2531024003	CK45F1H103Z	0.01μF 50V
C407,408	2551120026	CQ93M1H152J	1500pF 50V
C409,410	2531024003	CK45F1H103Z	0.01μF 50V
C411	2551120000	CQ93M1H102J	1000pF 50V
C413~415	2531024003	CK45F1H103Z	0.01μF 50V
C416	2539002001	CK45=1E104Z	0.1μF 25V
C417,418	2551120097	CQ93M1H562J	5600pF 50V
C419,420	2551120042	CQ93M1H222J	2200pF 50V
C421,422	2533632008	CC45SL1H161J	160pF 50V
C423,424	2531024003	CK45F1H103Z	0.01μF 50V
C425,426	2544134003	CE04W1C330=	33μF 16V
C427,428	2531024003	CK45F1H103Z	0.01μF 50V
C441,442	2531024003	CK45F1H103Z	0.01μF 50V
C501,502	2544080005	CE04W1E102M	1000μF 25V
C503,504	2544163029	CE04W1C471M	470μF 16V
C505,506	2544197008	CE04W1C222M	2200μF 16V
C507,508	2544197011	CE04W1C102M	1000μF 16V
C509	2544162020	CE04W1A471M	470μF 10V
C510	2544130007	CE04W1A101=	100μF 10V
C325	2544200005	CE04W1H010=(SL)	1μF 50V
OTHER PARTS GROUP			
	4990040008	RM-557	
	4140398005	SHIELD CASE	
	4178028101	HEAT SINK	
	4150307002	INSULATING SHEET	
	4150308001	BUSH	
	4179010008	RADIATOR	
	4438568107	LED HOLDER	

Ref. No.	Part No.	Part Name	Remarks
LE201, 202,205	3939315009	LED (GL-5NG10)	
LE203, 204	3939314000	LED (GL-5HY10)	
	4158060037	PVC TUBE	BLACK
	4150325000	PVC TUBE	CLEAR
X201	3990024009	FCR 4.0M2	
X301	3990029004	X'TAL (8.4672MHz)	
L301	2350017000	INDUCTOR (7μH)	
	2048179001	2P PIN JACK	
	2048105017	H/P JACK	
	2124388004	TACT SWITCH	
	4430457009	F.L HOLDER	
	3934018000	FIP4A6	
	2123337001	SLIDE SWITCH	
	2048190006	8P DIN CONNECTOR	
TP201	2050190065	6P NH CONNECTOR BASE	
TP202, 204,206, 207	2050190036	3P NH CONNECTOR BASE	
CB201, 202	2050233074	7P EH CONNECTOR BASE	
CB203	2050233061	6P EH CONNECTOR BASE	
CB204 ~207	2050233032	3P EH CONNECTOR BASE	
CB208	2050233058	5P EH CONNECTOR BASE	
CB252	2050279070	7P PH SID CONNECTOR BASE	
	2050271078	7P PH CONNECTOR BASE	
	2046080011	12P CONNECTOR CORD	
	2034242010	3P CONNECTOR ASS'Y	
	2034295009	3P WIRE ASS'Y	
	2038149106	5P CONNECTOR ASS'Y	
	2042146001	7P PH CON CORD	
	2042138006	7P-5P WIRE ASS'Y	
	2032183003	2P WIRE ASS'Y	

KU-5820 CONDENSER UNIT

Ref. No.	Part No.	Part Name	Remarks
C352 ~354	2539002001	CK45=1E104Z	0.1μF 25V

• The carbon resistors rated at ¼W are not listed herein.

PARTS LIST OF P.W. BOARD

KU-5720 SERVO AMP UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTORS GROUP			
IC101	2620613008	CX20109	
IC102	2620612009	CX20108	
IC103	2630257001	M-5218P	
TR101	2740036002	2SD468(C)	
TR102	2720025004	2SB562(C)	
TR103	2740036002	2SD468(C)	
TR104	2720025004	2SB562(C)	
TR105	2740036002	2SD468(C)	
TR106	2720025004	2SB562(C)	
TR107	2740036002	2SD468(C)	
D101	2760049008	1S2076	
D102	2760236057	HZ5C-3	
D103	2760049008	1S2076	
RESISTOR GROUP			
R161	2452191002	RN14K2E222G	2.2kΩ 1/4W
R162	2452175002	RN14K2E471G	470Ω 1/4W
R163	2452207006	RN14K2E103G	10kΩ 1/4W
R164	2452211005	RN14K2E153G	15kΩ 1/4W
R168	2452146002	RN14K2E360G	36Ω 1/4W
R169	2452153008	RN14K2E560G	56Ω 1/4W
VR101	2116046037	V06QB334	330kΩ
VR102	2116046011	V06QB473	47kΩ
VR103	2116046008	V06QB103	10kΩ
VR104	2116046008	V06QB103	10kΩ
CAPACITOR GROUP			
C101	2544146004	CE04W1H010	1μF/50V
C102	2551121038	CQ93M1H123J	0.012μF/50V
C103,104	2533611003	CC45SL1H220J	22pF/50V
C105,106	2533615009	CC45SL1H330J	33pF/50V
C107	2561034018	CF93A1H333J	0.033μF/50V
C108	2551121025	CQ93M1H103J	0.01μF/50V
C109	2544145005	CE04W1HR47=	0.47μF/50V
C110	2544129005	CE04W1A470=	47μF/10V
C111	2544146004	CE04W1H010=	1μF/50V
C112,113	2544130007	CE04W1A101=	100μF/10V
C121	2551120042	CQ93M1H222J	2200pF/50V
C122	2533643000	CC45SL1H471J	470pF/50V
C123	2544132005	CE04W1C100=	10μF/16V
C124	2544140000	CE04W1V4R7=	4.7μF/35V
C125	2533639001	CC45SL1H331J	330pF/50V
C126	2561034063	CF93A1H823J	0.082μF/50V
C127,128	2533627000	CC45SL1H101J	100pF/50V
C129	2561034076	CF93A1H104J	0.1μF/50V
C130,131	2544132005	CE04W1C100=	10μF/16V
C132	2551121038	CQ93M1H123J	0.012μF/50V
C133	2551121012	CQ93M1H822J	8200pF/50V
C134	2561035020	CF93A1H274J	0.27μF/50V
C135	2544162020	CE04W1A471M	470μF/10V
C137	2561035004	CF93A1H184J	0.18μF/50V
C161~163	2544130007	CE04W1A101=	100μF/10V
C164	2531024003	CK45F1H103Z	0.01μF/50V
C170	2544146004	CE04W1H010=	1μF/50V

Ref. No.	Part No.	Part Name	Remarks
OTHER PARTS GROUP			
	2052033032	3P EH CONNECTOR BASE	
	2050233061	6P EH CONNECTOR BASE	
	2050233074	7P EH CONNECTOR BASE	
	2050234044	4P EH SID CONN. BASE	
	2050234086	8P EH SID CONN. BASE	
	2050190036	3P NH CONNECTOR BASE	
	2050190065	6P NH CONNECTOR BASE	

● The carbon resistors rated at ¼W are not listed herein.

KU-5751 LINE FILTER UNIT (EC, EU)

Ref. No.	Part No.	Part Name	Remarks
⚠ CH501	2398019002	LINE FILTER COIL	
⚠ C510 ~512	2538010007	CK45=2GAC103P	0.01μF 400VAC
	2032160039	2P CONNECTOR CORD	
	2050217029	2P CONNECTOR BASE	
⚠	2123336002	SDL-1P-B POWER SW	
	2050185054	5P WIRE HOLDER	
	2038146028	5P EH CON. CORD	

KU-5752 LINE FILTER UNIT (E2)

Ref. No.	Part No.	Part Name	Remarks
⚠ CH501	2398019002	LINE FILTER COIL	
⚠ C510 ~512	2538010007	CK45=2GAC103P	0.01μF 400VAC
	2032160039	2P CONNECTOR CORD	
	2050217029	2P CONNECTOR BASE	
⚠	2123336002	SDL-1P-B POWER SW	
	2050185054	5P WIRE HOLDER	
	2038146028	5P EH CON. CORD	
	4150299000	CONDENSER COVER	
⚠ F1	2061031032	FUSE	(0.16A)
⚠	FEP1287	FUSE HOLDER	
⚠	4150305017	P.V.C TUBE	
⚠	2061015003	FUSE	(500mA)

KU-5753 LINE FILTER UNIT (E1)

Ref. No.	Part No.	Part Name	Remarks
⚠ CH501	2398019002	LINE FILTER COIL	
⚠ C510 ~512	2538010007	CK45=2GAC103P	0.01μF 400VAC
	2032160039	2P CONNECTOR CORD	
	2050217029	2P CONNECTOR BASE	
⚠	2123336002	SDL-1P-B POWER SW	
	2050185054	5P WIRE HOLDER	
	2038146028	5P EH CON. CORD	
⚠ F1	2061015003	FUSE	(500mA)
⚠	FEP1287	FUSE HOLDER	
	5138254037	FUSE LABEL	(500mA)
	2050217045	4P CON. BASE (ULTR)	

KU-5754 LINE FILTER UNIT (EA)

Ref. No.	Part No.	Part Name	Remarks
⚠ CH501	2398019002	LINE FILTER COIL	
⚠ C510 ~512	2538010007	CK45=2GAC103P 400VAC	0.01μF
	2032160039	2P CONNECTOR CORD	
	2050217029	2P CONNECTOR BASE	
⚠	2123336002	SDL-1P-B POWER SW	
	2050185054	5P WIRE HOLDER	
	2038146028	5P EH CON. CORD	
	4150299000	CONDENSER COVER	
⚠ F1	2061031032	FUSE	(0.16A)
⚠	FEP1287	FUSE HOLDER	
⚠	4150305017	P.V.C TUBE	

KU-5755 LINE FILTER UNIT (EK)

Ref. No.	Part No.	Part Name	Remarks
⚠ CH501	2398019002	LINE FILTER COIL	
⚠ C510 ~512	2538010007	CK45=2GAC103P	0.01μF 400VAC
	2032160039	2P CONNECTOR CORD	
	2050217029	2P CONNECTOR BASE	
⚠	2123336002	SDL-1P-B POWER SW	
	2050185054	5P WIRE HOLDER	
	2038146028	5P EH CON. CORD	
	4150299000	CONDENSER COVER	
⚠ F1	2061031032	FUSE	(0.16A)
⚠	FEP1287	FUSE HOLDER	
⚠	4150305017	P.V.C TUBE	
⚠	2061015003	FUSE	(500mA)

WARNING:
Parts marked with ⚠ and/or shading have special characteristics important to safety.
Be sure to use the specified parts for replacement.

Remarks symbols in the parts list refer to the following countries and areas.

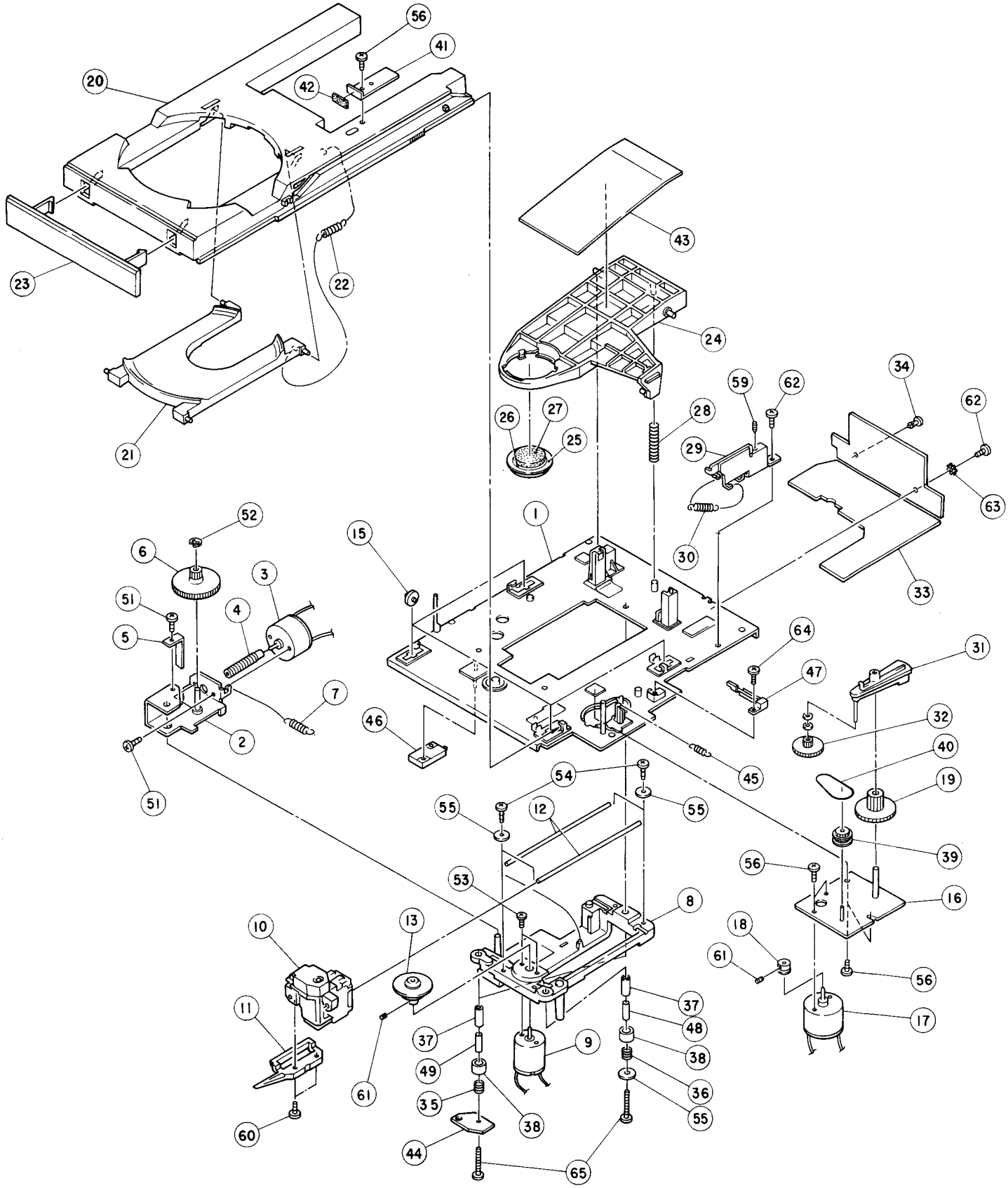
EA:	Australia	EC:	Canada
E1:	Multiple voltage model	EU:	U.S.A.
E2:	European continent	EK:	United Kingdom

PARTS LIST OF FG-500 CD MECHA UNIT

Ref. No.	Part No.	Part Name	Remarks
1	4110480309	MECHA PLATE	
2	4121862204	MOTOR BRACKET ASS'Y	
3	2170140005	SLIDE MOTOR	
4	4240093006	WORM GEAR ASS'Y	
5	4121863009	SPRING PLATE	
6	4240089308	HELICAL GEAR	
7	4638225004	SPRING (GEAR)	
8	3150329308	HOUSING	
9	2170139003	SPINDLE MOTOR	
10	4990044004	KSS121A	
11	4250169205	RACK	
12	4310192002	SLIDE SHAFT	
13	4210338209	TURNTABLE	
14	KU-5710-2		
15	4250170003	SLIDER ROLLER	
16	4121939001	MOTOR PLATE ASS'Y	
17	2170142003	LOADING MOTOR	
18	4210366006	PULLEY (A)	
19	4240090106	DRIVE GEAR	
20	4310191207	LOADER FRAME	
21	4310190208	DISC TRAY	
22	4630435106	DISC TRAY SPRING	
23	4250171206	LOADER PANEL	
24	4330426208	CLAMPER ARM	
25	4210336308	CLAMPER PRESS	
26	4310194000	CLAMP MAGNET	
27	4630441006	CLAMPER SPRING	
28	4610162020	FELT PAD	
29	4121877105	ADJUST BRACKET ASS'Y	
30	4638231105	SPRING	
31	4210340103	LOCK ARM ASS'Y	
32	4240091202	GEAR	
33	KU-5720	SERVO AMP UNIT	
34	4770096007	PUSH RIVET	
35	4630440007	COIL SPRING	
36	4630440010	COIL SPRING	
37	4620062000	DAMPER (A)	
38	4620063009	DAMPER (B)	
39	4240100009	GEAR(P)	
40	4230043008	BELT	
41	4121890108	LOADER STOPPER	
42	1220117C15	HYMERON SHEET	
43	4610259001	RUBBER PAD	
44	4410597002	DAMPER PLATE	
45	4638260001	SPRING	
46	2123335003	MICRO-SW	(SCL-101P)
47	2124575008	LEAF-SW	(MSW-1585)
48	4430458008	COLLAR	
49	4430468001	COLLAR (S)	

Ref. No.	Part No.	Part Name	Remarks
51	4713201011	2.6x4 CBS	
52	4761003009	3E RING	
53	4713102013	2x5 CBS-Z	
54	4737500002	3x6 CBTS(P)-Z	
55	WA-0107H4	WASHER	
56	4737508017	3x10 CBTS(P)-B	
57	4751106000	WASHER	
58	4713303016	3x6 CBS-Z	
59	4744306008	3x10 BSS	
60	4713204018	2.6x8 CBS-Z	
61	4714300004	2.6x4 BBS(A)	
62	4737002005	3x6 CBTS(S)-Z	
63	4753001006	3T WA	
64	4737505023	2.6x10 CBTS-Z	
65	4711807006	3x18 CPS	

EXPLODED VIEW OF FG-500 MECHA UNIT



PARTS LIST OF EXPLODED VIEW

Ref. No.	Part No.	Part Name	Remarks
1	1030830605	CHASSIS	
	1030830621	CHASSIS	E1 only
2	1020212204	BOTTOM COVER	
3	4610162004	FELT PAD	
4	4121874205	EARTH PLATE	
5	KU-5740	SIG PROC AUDIO UNIT	
6	4770096007	PUSH RIVET	
7	KU-5740-01	SIG PROC AUDIO UNIT	
8	1030838500	FRONT PANEL ASS'Y	
9	4630437007	SPRING	
10	1130731400	KNOB (B)	
11	1130732302	KNOB (C)	
12	1130730207	KNOB (A)	
13	4110484101	PRESS BAR	
14	1130737404	KNOB (D) ASS'Y	
15	1120475006	H/P KNOB	
16	4121873219	TRANS BRACKET	EA,EC,EK,E2
16	4121873206	TRANS BRACKET	EU,E1
⚠ 17	2335514010	POWER TRANS	EA,EK,E2
⚠ 17	2335522015	POWER TRANS	EC
⚠ 17	2335513011	POWER TRANS	EU
⚠ 17	2335517017	POWER TRANS	E1
⚠ 18	KU-5751	LINE FILTER UNIT	EC,EU
⚠ 18	KU-5752	LINE FILTER UNIT	E2
⚠ 18	KU-5753	LINE FILTER UNIT	E1
⚠ 18	KU-5754	LINE FILTER UNIT	EA,EK
⚠ 19	2006019323	AS 3P AC CORD	EA
⚠ 19	2062031002	AC CORD	EC
⚠ 19	2062024006	AC CORD WITH LABEL	EK
⚠ 19	2062019008	AC CORD WITH PLUG	EU
⚠ 19	2006031026	AC CORD	E1
⚠ 19	2062002031	AC CORD WITH PLUG	E2
⚠ 20	MD-3802	BUSHING	EU,E1
⚠ 20	MD-2982H	CORD BUSH	EA
⚠ 20	4450020005	CORD BUSH	EC,EK,E2
21	2030150009	WIRE CONNECTOR	
22	1130734106	P.SW LEVER ASS'Y	
23	1020211111	TOP COVER	
24	1460772003	TOP COVER WASHER	
25	FG500	CD MECHA UNIT	
26	3418031008	F. MAGNET	
27	EP-4772	CORD HOLDER	
28	KU-5820	CONDENSER UNIT	
29	KU-5740-02	SIG PROC AUDIO UNIT	
30	KU-5740-03	SIG PROC AUDIO UNIT	
31	KU-5740-04	SIG PROC AUDIO UNIT	
32	KU-5740-05	SIG PROC AUDIO UNIT	
33	4610246106	RUBBER WASHER	
34	4737514001	SPECIAL SCREW	
35	4438722011	SPECIAL SCREW (A)	
36	5040093001	TOP COVER SHEET	
⚠ 37	KU-5750-01	LINE FILTER UNIT	POWER SW.
51	4737508017	3x10 CBTS(P)-B	
52	4737500015	3x8 CBTS(P)-Z	
53	4737004003	4x8 CBTS(S)-Z	
54	4737508020	3x12 CBTS(P)-Z	
55	4737005002	3x10 CBTS(S)-Z	
⚠ 56	2123315023	VOLTAGE SELECTOR	E1 only
57	1040034006	STOPPER	

PACKING & ACCESSORIES GROUP

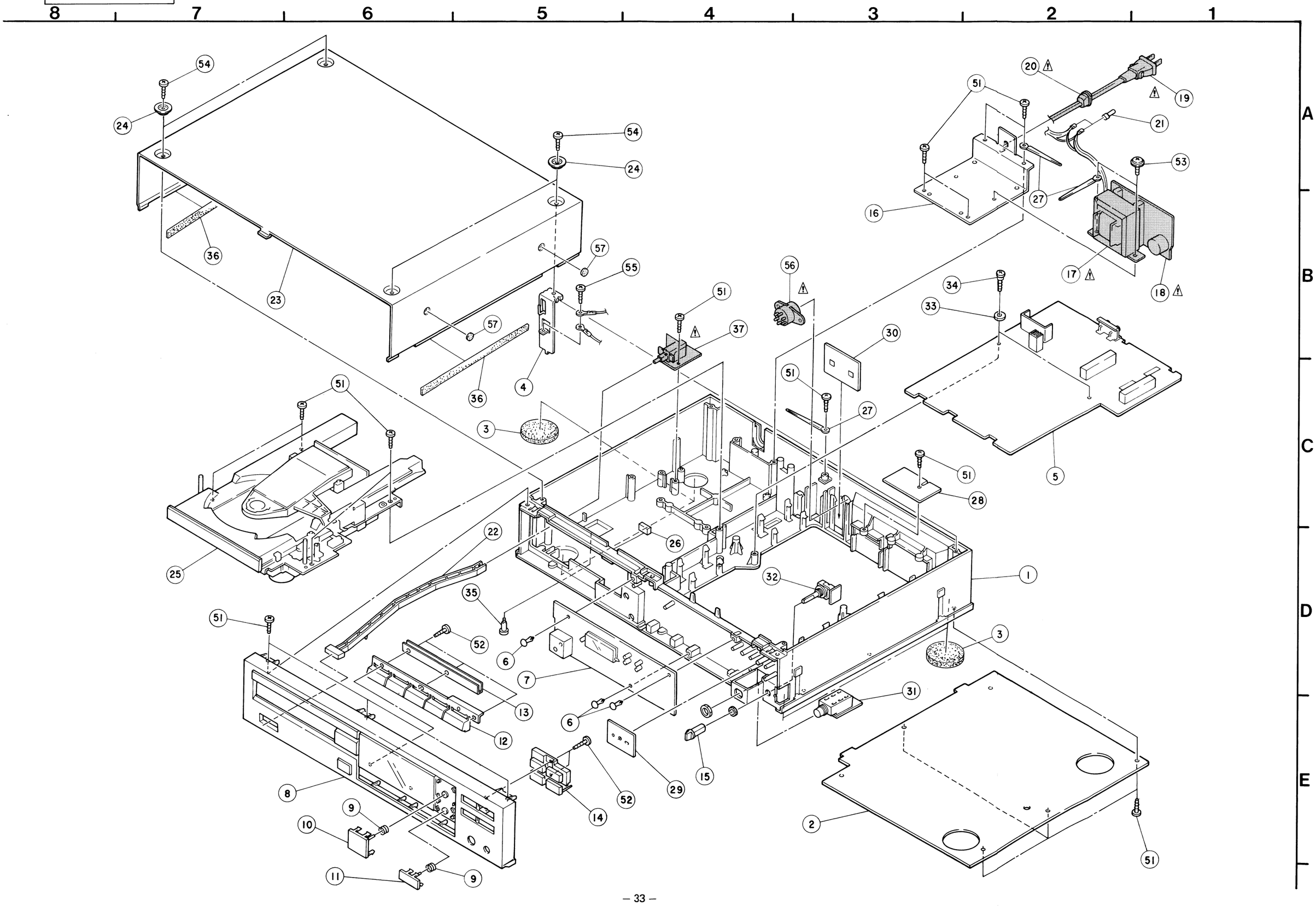
Ref. No.	Part No.	Part No.	Remarks
PACKING & ACCESSORIES GROUP			
	5058092036	LAMINATE ENVELOPE	
	5030519100	PACKING	
	5011070215	CARTON CASE	
	5050061007	ENVELOPE	
	2048121004	2P PIN CORD	
	5111349105	INST. MANUAL	
	5111348009	INST. MANUAL	EU only
	4990045003	RC 1100	E2 only
	2036149001	4P CONNECTOR CORD	E1 only
	2033667007	PLUG ADAPTER	E1 only

WARNING:
Parts marked with ⚠ and/or shading have special characteristics important to safety.
Be sure to use the specified parts for replacement.

Remarks symbols in the parts list refer to the following countries and areas.

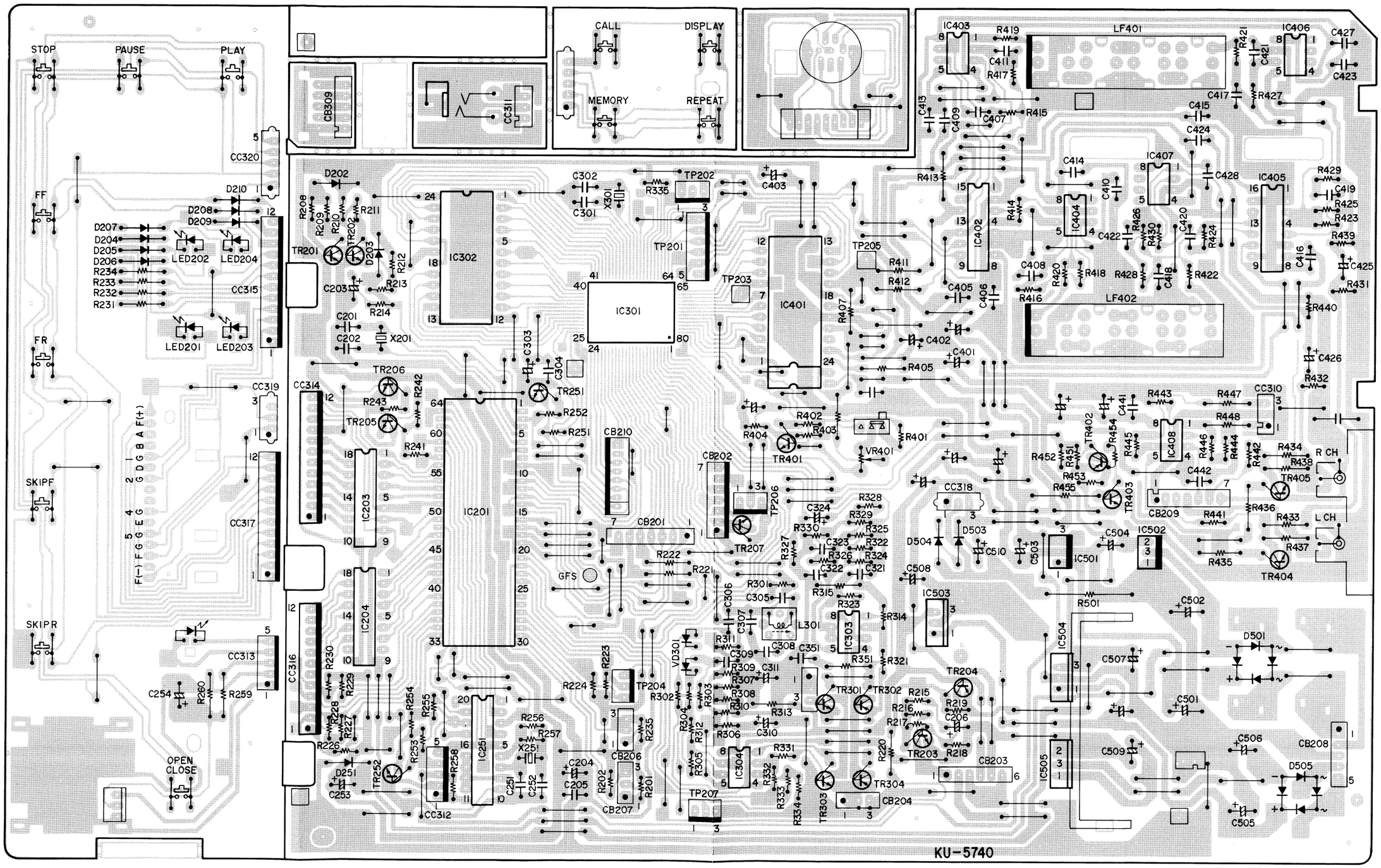
EA:	Australia	EC:	Canada
E1:	Multiple voltage model	EU:	U.S.A.
E2:	European continent	EK:	United Kingdom

EXPLODED VIEW

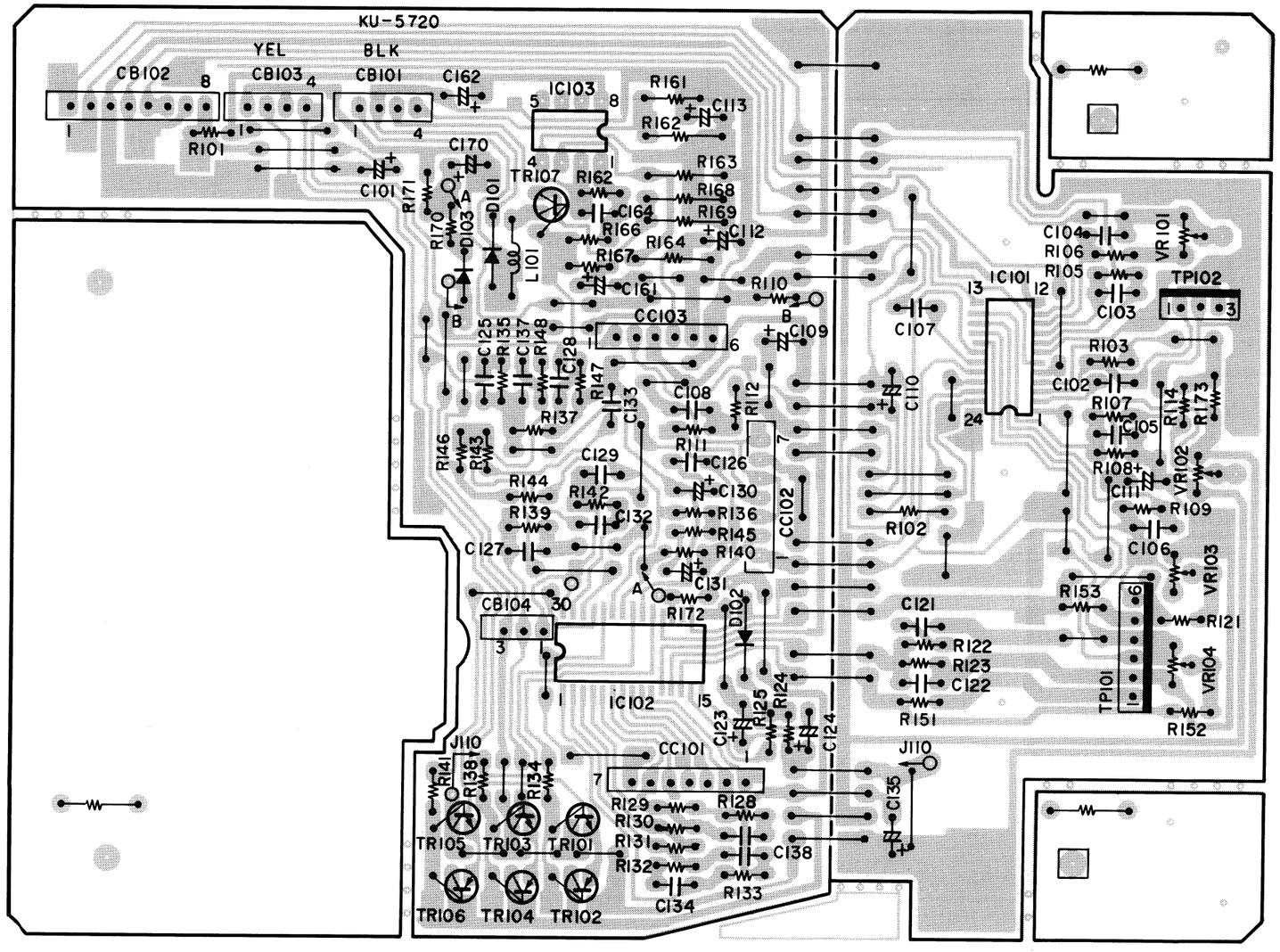


P.W. BOARD

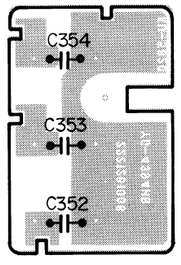
KU-5740 SIG PROC AUDIO UNIT



KU-5720 SERVO AMP UNIT

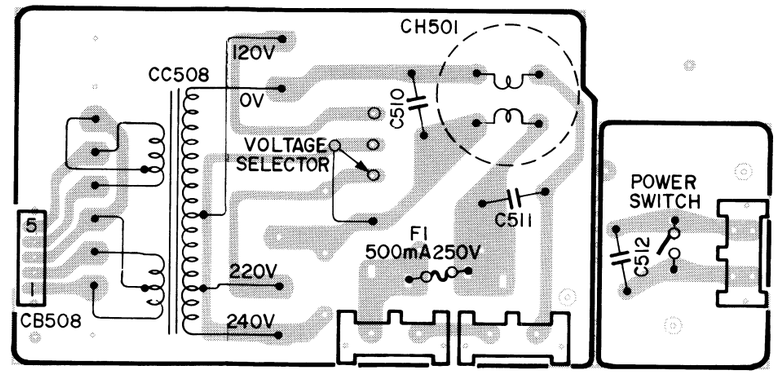


KU-5820 CONDENSER UNIT

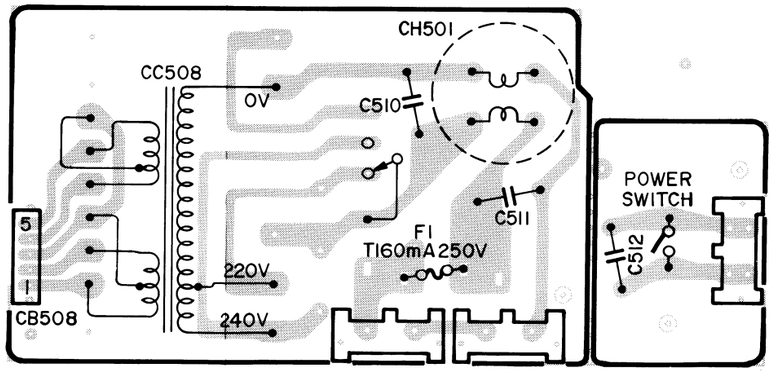


LINE FILTER UNIT

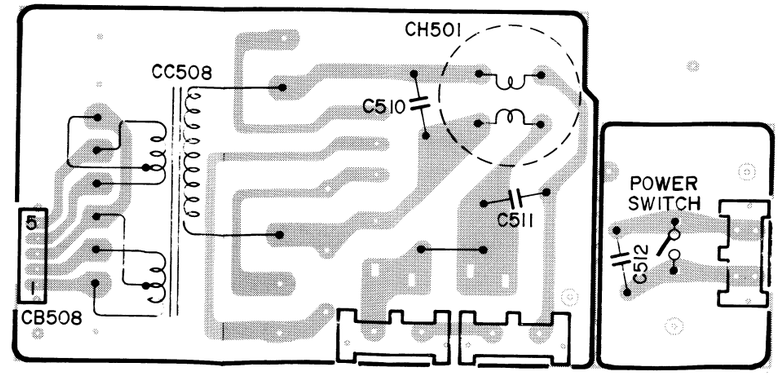
KU-5753 (E1)



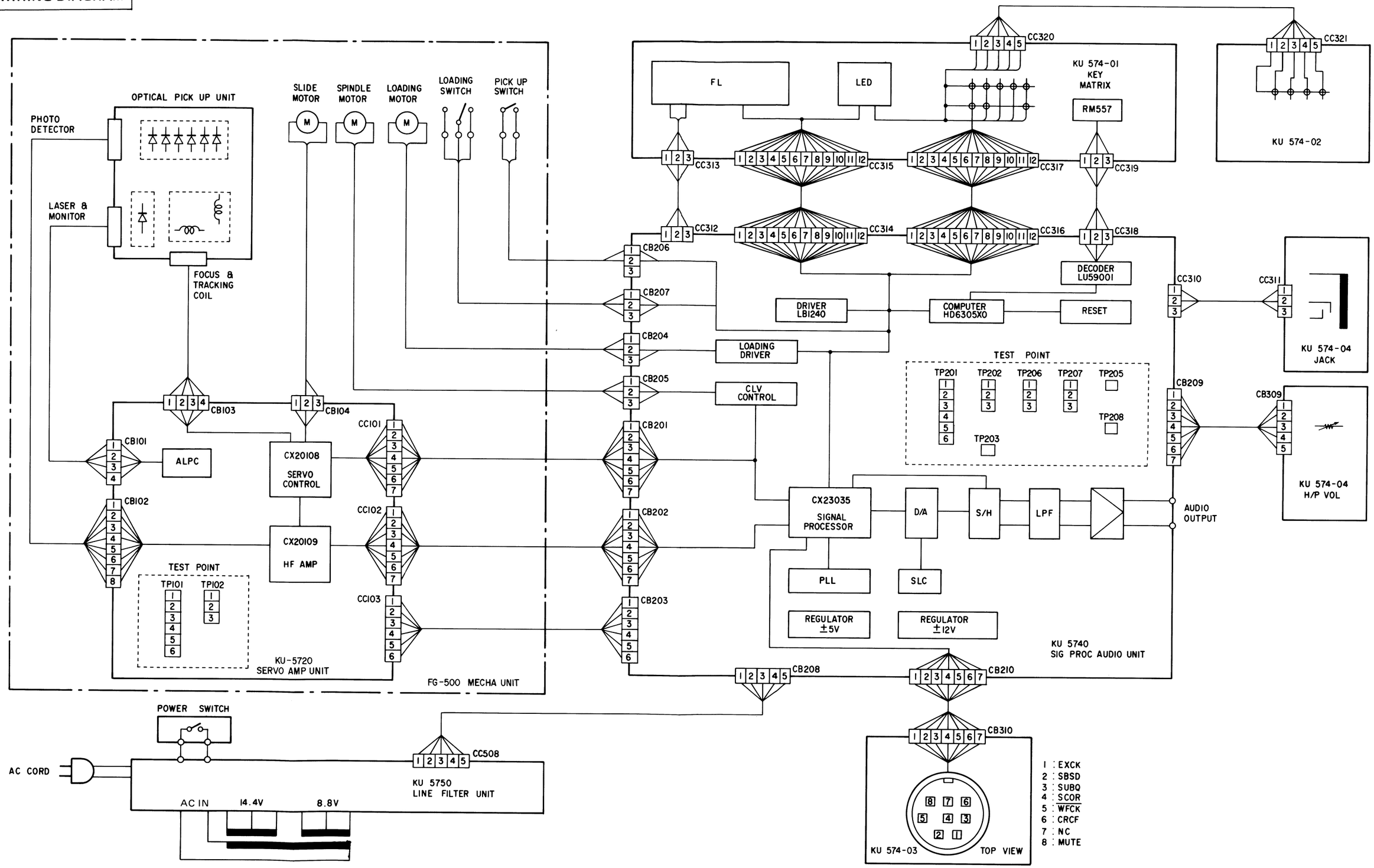
KU-5752/5754 (E2, EA, EK)



KU-5751 (EC, EU)

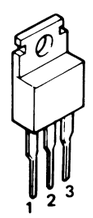


WIRING DIAGRAM



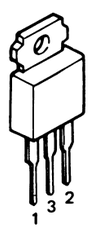
SEMICONDUCTORS

● IC



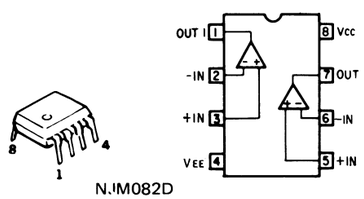
1: Input
2: Common
3: Output

NJM78M05A
NJM78M12A

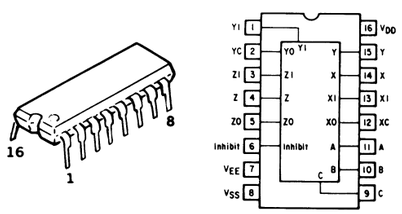


1: Gnd
2: Output
3: Input

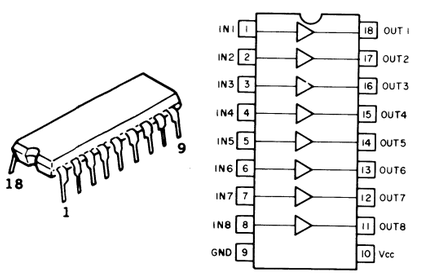
NJM79M12A
NJM79M05A



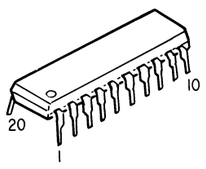
NJM082D
NE5532
M5218P
NJM4556D

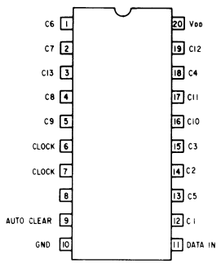


TC-4053BP
HD-14053BP

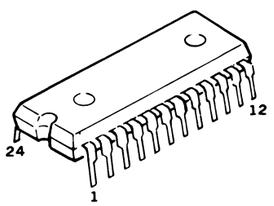


LB1240

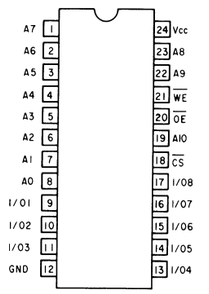




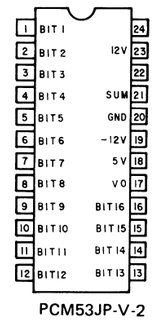
LU59001



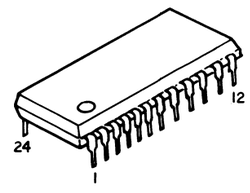
HM6116P-4
PCM53JP-V-2



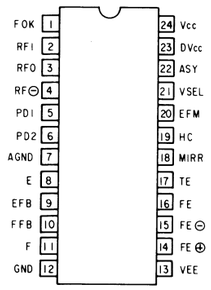
HM6116P-4

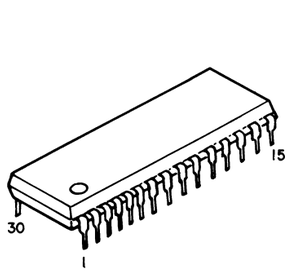


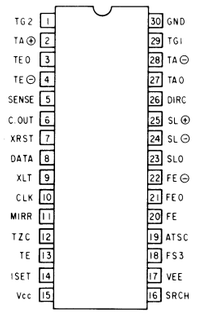
PCM53JP-V-2



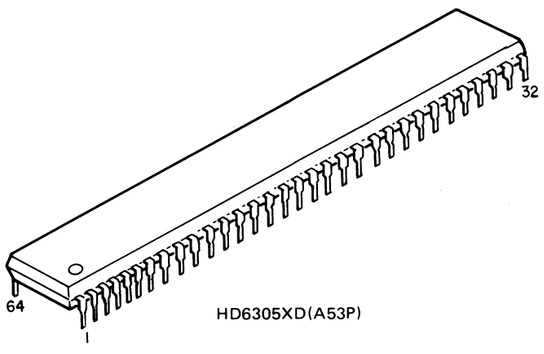
CX20109



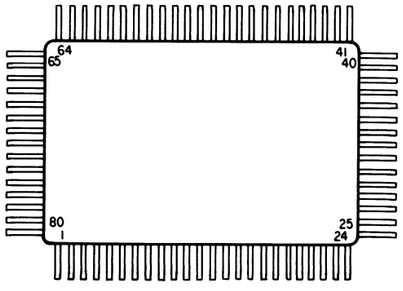




CX20108



HD6305XD(A53P)

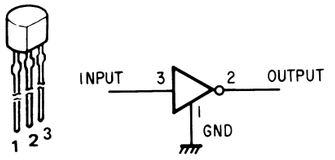


CX23035

● Transistors

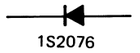
2SA933(Q)
2SC1740(K/S)
2SC2878(A/B)

2SB562(C)
2SD468(C)



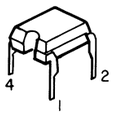
DTC124XS

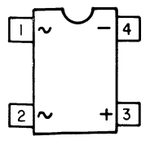
● Diodes



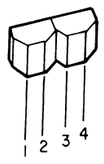
1S2076

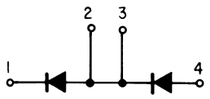
HZ4B-2
HZ5C-3





S1WB



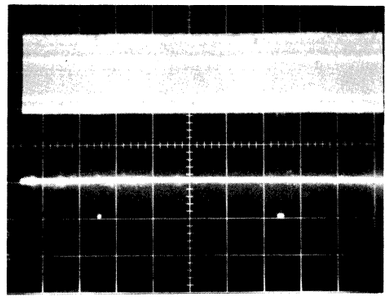


KV1236

WAVEFORM IN THE CIRCUIT

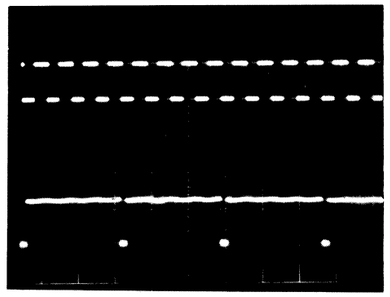
(1) HF Output Waveform (2) GFS Output Waveform

0.5V/DIV、 5 ms/DIV 5 V/DIV、5 ms/DIV

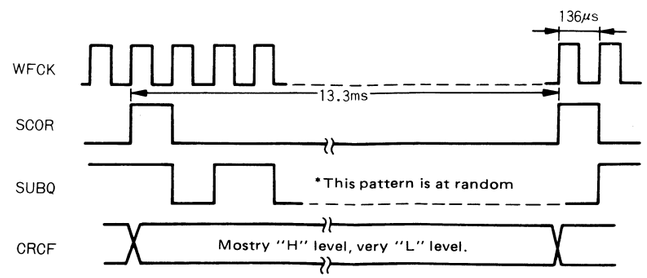


(3) MDS Output Waveform (4) MDP Output Waveform

5 V/DIV、200μS/DIV 2 V/DIV、200μs/DIV



(5) WFCK, SCOR, SUBQ, CRCF



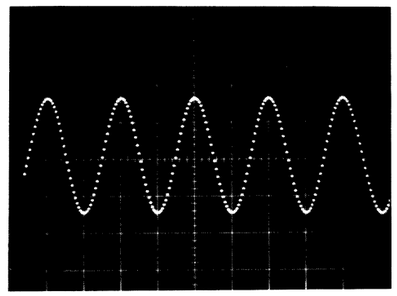
(6) D/A Converter Output

(38C39-7147)

T NO. 49 Playback

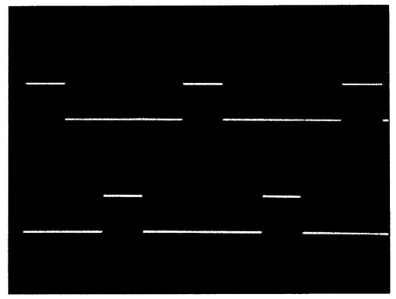
(100kHz 0 dB L+R)

5 V/DIV、500μs/DIV

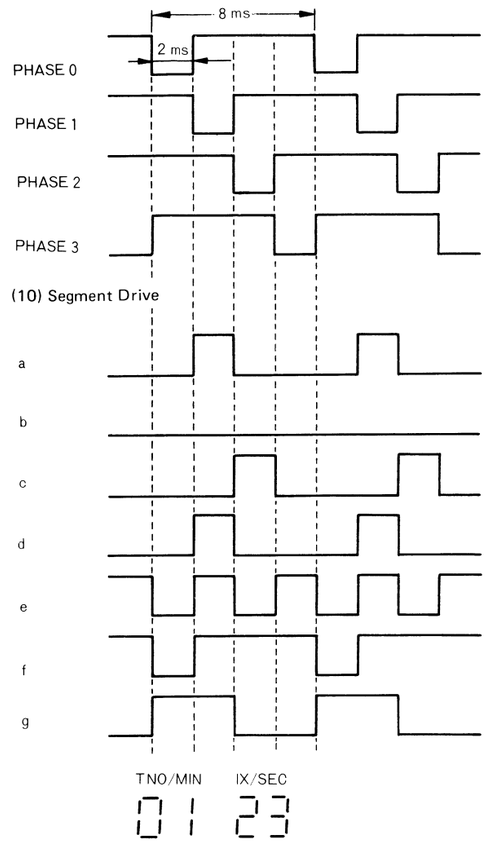


(7) APTL Output Waveform (8) APTR Output Waveform

5 V/DIV、 5 μs/DIV 5 V/DIV、 5 μs/DIV

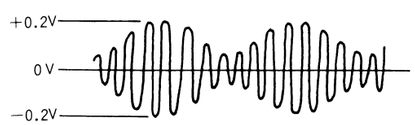


(9) Dynamic Driver Phase



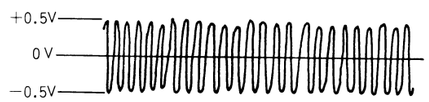
(10) Segment Drive

(11) Focus Drive Waveform



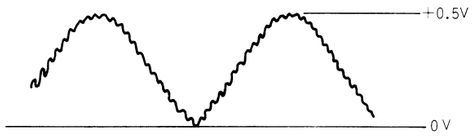
Oscilloscope ms/div

(12) Tracking Drive Waveform



Oscilloscope 1 mS/div

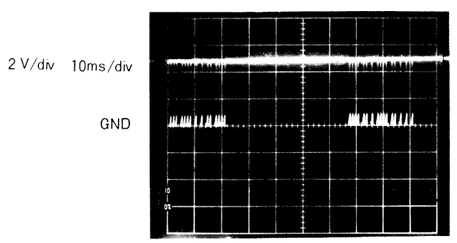
(13) Slide Drive Waveform



Few Seconds Cycle

(14) RM557 Output (LU59001 pin (11))

PLAY button operated by remote control



11 10 9 8 7 6

SIGNAL PROCESS PWB (KU-5740)

SERVO PWB (KU-5720)

6 5 4 3 2 1

A B C D E F G H

DISPLAY PWB (KU-5740)

OPERATION KEY PWB

IC251 LU59001

IC203 LB1240

IC204 LB1240

IC402 TC4053BP (1/3)

IC402 TC4053BP (3/3)

IC402 TC4053BP (2/3)

IC403 NE5532 (1/2)

IC403 NE5532 (2/2)

IC404 NE5532(1/2)

IC404 NE5532(2/2)

IC405 HD14053BP(1/2)

IC405 HD14053BP(2/2)

IC406 M5218P

IC407 M5218P

IC408 NJM4556(1/2)

IC408 NJM4556(2/2)

IC503 NJM78M05A

IC504 NJM78M05A

IC505 NJM79M05A

IC501 NJM78M12A

IC502 NJM79M12A

TR205 2SA933

TR206 2SD468

TR401 2SC1740

TR402 2SA933

TR403 2SC1740

TR404 2SC2878

TR405 2SC2878

TR103 2SD468

TR104 2SB562

FL101 FIP4A6

RM557

LF401

LF402

D501 SIWB(A)110

D505 SIWB(A)110

D503 IS2076A

D504 IS2076A

LED251

LED201 SEL1910D

LED202 SEL1910D

LED203 SEL1310G

LED204 SEL1310G

D204 IS2076A

D205 IS2076A

D206 IS2076A

D207 IS2076A

D208 ISS106

D209 ISS106

D210 ISS106

CC312 CC313 CC314 CC315 CC316 CC317 CC318 CC319 CC320 CC321 CC310 CC311

CB208 CB209 CB309 CB310 CB210

CC508

CH501

PHONES

LEVEL VR402 10kA

L CH OUTPUT R CH

PLAY PAUSE SKIP F SKIP R STOP FF FR OPEN/CLOSE

DISPLAY REPEAT MEMORY CALL

PHASE 2 PHASE 1 PHASE 0 Waveform (9)

PLAY PAUSE REPEAT MEMORY G1 G2 G4 G5

g f e d c b a

Waveform (14) Waveform (10) Waveform (9) Waveform(7) Waveform(8)

5VD -5V 5VA 12V -12V EMPM APTL APTR MUTG C B A

AUDIO MUTING

SL+ SL- SLO

SLIDE DRIVE

NG DRIVE

ATSC CLK XLT DATA X RST C OUT SENSE DIRC

DA1 BIT16

CC508 POWER P.W.B

POWER PWB (Europe. Australia) KU-5752/5754/5755 (E2, EA, EK)

POWER PWB (USA. Canadian) KU-5751 (EC, EU)

POWER PWB (Multi-Voltage) KU-5753 (EI)

VOLTAGE SELECTOR 240V 220V 120V OFF

POWER TRANS AC CORD POWER SWITCH

基板取付面 SUB CORD OUT

SCOR SUBQ SBSQ EXCK MUTG CRCF

NOTE 1. UNLESS OTHERWISE SPECIFIED, ALL RESISTOR VALUES IN OHMS, 1/4 WATT
2. UNLESS OTHERWISE SPECIFIED, ALL CAPACITANCE VALUES ARE IN μF, P=PF
3. THIS SCHEMATAIC DIAGRAM IS BASIC CIRCUITRY AND SUBJECT TO CHANGE WITHOUT NOTICE FOR FURTHER IMPROVEMENT